BIOPSYCHOSOCIAL INFLUENCES ON CHILDREN'S EVENT RECALL AND RECALL PERSPECTIVE FOR EMOTIONAL EVENTS

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ABSTRACT

The findings of studies examining the impact of emotion on memory are mixed. One possible reason for the inconsistent findings is that individual differences in memory for emotional events have not been taken into account (Goodman, Quas, Batterman-Faunce, Riddlesberger & Kuhn, 1997). Another possible reason for the inconsistent findings in the literature may be that arousal and valence, the two components of emotion, are not measured independently (Brainerd, Holliday, Reyna, Yang, & Toglia, 2010). The main purpose of the current study was to determine the manner in which factors that exist before (i.e., age, gender, attachment, temperament), during (i.e., emotional valence, emotional arousal), and following an event (i.e., interview techniques, recall perspectives) account for variance in children's recall of emotional events and which factors account for the most variance. Further objectives of this study were to examine the manner in which emotion, age of the memory and age and gender of the child account for variance in the recall perspective children use to retrieve emotional memories as well as whether field and observer recall perspectives differ in terms of the amount of anxiety children experience during recall. One hundred children completed self-report measures and described two positive and two negative events; one of each was highly arousing and one was minimally arousing. Age and temperament were the strongest predictors of children's overall event recall, recall of different memory components, and recall of central and peripheral details. Consistent with the hypotheses presented, older children, and children with increased behavioural flexibility, approach tendencies, and a more positive quality of mood reported more details in their event narratives. Increases in the intensity of valence and arousal in negative memories were associated with enhanced event recall. Further, once variance in the number of details recalled, shared by valence and arousal, was removed emotional valence best accounted for increases in the number of details children recall from negative events. Children who used the first person (field) recall perspective recalled more contextual and behavioural details of memories with negative valence and high arousal and more sensory/somatosensory details of memories with positive valence and high arousal than children who used the third person (observer) recall perspective. The Comprehensive Narrative Elaboration Technique was associated with increased reports of sensory details and more cognitive details of memories with negative valence and low arousal compared to the Narrative Elaboration Technique. Of the

variables examined, only age of the memory was related to the recall perspective naturally chosen by children, highlighting differences between the adult and child literature. The degree of anxiety experienced by children did not vary as a result of recall perspective. It is important to understand the manner in which predisposing, precipitating, and perpetuating factors influence children's recall. In forensic contexts, the quantity and quality of the information obtained from child witnesses during forensic interviews is often crucial to the outcome of a case (Marche, & Salmon, 2003). Information was obtained regarding the relative importance of variables that influence children's memory which may assist researchers, clinicians, and interviewers in their understanding of children's ability to recall event details.

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DEDICATION

This dissertation is dedicated to my family. You are my greatest blessing, my utmost strength, and my biggest weakness.

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Chapter 1. LITERATURE REVIEW

A significant amount of research has focused on children's memory for emotional autobiographical memories (e.g., Ford, Addis, & Giovanello, 2012) or recollections of specific life events (Williams, Conway, & Cohen, 2008). This research has been motivated by the forensic implications of recalling emotionally negative events, as well as the mood (Isen, 1985; 1987; Rusting, & DeHart, 2000) and memory enhancing effects of recalling positive events (Berntsen, 2002; Talarico, Berntsen, & Rubin, 2009). Research on children's emotional autobiographical memories is necessary to address and control for developmental differences in recall ability in forensic contexts. For example, younger children produce narratives that are shorter and less coherent than older children (Fivush, Haden, & Adam, 1995; Goodman et al., 1997), which means that younger children may have more difficulty providing the details necessary to obtain a conviction.

In order to increase the amount of accurate information that children report, interviewers and researchers should be aware of the factors that influence the recall of autobiographical memories (Williams et al., 2008). Following decades of research in this area, researchers have discovered a number of variables that influence children's recall of autobiographical events, including: age (Fivush et al., 1995; Goodman et al., 1997), gender (Fivush, 1993; Salmon, Bidrose, & Pipe, 1995), attachment (Alexander, Quas et al., 2002), temperament (Gordon, Ornstein, Nida, Follmer, Crenshaw, & Albert, 1993; Merritt, Ornstein, & Spicker, 1994), emotional valence (Fivush, Hazzard, Sales, Sarfati, & Brown, 2003), emotional arousal (Peterson & Whalen, 2001) as well as several others (see Marche & Salmon, 2013, for review). However, the relative importance of each of these variables and how the variables account for individual variance in children's recall at different stages of development is unknown.

One variable that has been found to impact adolescent (Hignette & Cartwright-Hatton, 2008) and adult autobiographical memory (McIsaac & Eich, 2002; 2004; Nigro & Neisser, 1993), but has not been examined with children, is recall perspective. Two recall perspectives have been identified (Nigro & Neisser, 1993), including a first person recall perspective (*field perspective*) and a third person recall perspective (*observer perspective*). Recall perspective has

been demonstrated to influence the quantity and subjective quality of memory details reported by individuals. For example, when recalling from the observer perspective, adults recall more physical details of the remembered scene; however, when recalling from the field perspective adults recall more psychological states and experience increased anxiety (McIsaac & Eich, 2004). This is an important distinction as, while the recall of key physical details may be important to a forensic investigation (Pozzulo, 2013; Pozzulo & Warren, 2003), psychological states are important in therapeutic contexts. That is, when uncomfortable emotion is experienced and expressed in therapy, this emotion can then be expressed more appropriately in interpersonal contexts (McCullough Vaillant, 1994). Therefore, it may be beneficial for individuals to utilize an observer perspective when providing witness statements and use the field perspective in therapeutic contexts. While the recall perspective used by an individual produces important qualitative differences in the information recalled, recall perspective is not usually an objective choice. Recall perspective is often influenced by gender (Huebner & Fredrickson, 1999), age of the memory (Nigro & Neisser, 1983), the anxiety associated with the event (McIsaac & Eich, 2004), and attempts to recall emotional states (Nigro & Neisser, 1983). It is important to examine the variables that influence recall perspective in children as they may influence the ease in which children are able to adopt a particular perspective in recall.

The purpose of the current study is to determine the manner in which factors that exist before, during, and following an event account for individual variance in children's recall of emotional autobiographical events and which factors account for the most variance. Further objectives of this study are to examine how gender, emotion, age of the memory, and age of the child can be combined to predict the recall perspective children use to retrieve emotional memories as well as whether field and observer recall perspectives differ in terms of the amount of anxiety children experience during recall.

The following introduction begins with a theoretical framework for the current study, outlining variables that may contribute to memory construction before, during, and following emotional events and that may influence an individual's ability to recall an emotional event. The review follows with a description and definition of each of the variables that will be examined as well as information concerning the influence of each variable on recall. Finally, any literature that exists on interactions among the variables are also reviewed.

Autobiographical memory has been an area of research interest for a number of years (see Fivush, 2011, for review). Autobiographical memory, or personal event memory, is integral (Williams et al., 2008) and specific to human functioning (Fivush, 2001). Autobiographical memory provides a framework for, and guides, future behavior (Baddeley, 1987), facilitates social interaction by providing material for conversation (Williams et al., 2008), provides a structure for individuals' identities by allowing individuals access to consistent beliefs and knowledge in autobiographical memories (Conway, 2005), and can improve mood through positive event reminiscence (Robinson & Swanson, 1990; Woods, Spector, Jones, Orrell, & Davies, 2005). A number of factors that influence autobiographical memory have been identified including: age (Fivush et al., 1995), gender (Salmon et al., 1995), attachment (Alexander, Quas et al., 2002), temperament (Merritt, Ornstein, & Spicker, 1994), emotional valence (Fivush et al., 2003), emotional arousal (Peterson & Whalen, 2001), anxiety (Hadwin & Field, 2010; McIsaac & Eich, 2004), stress reactivity (Levine & Edelstein, 2009), coping strategies, and emotional regulation (Kensinger, 2009; Levine & Edelstein, 2009), and time delay following the event (Burgwyn-Bailes, Baker-Ward, Gordon, & Ornstein, 2001; Nigro & Neisser, 1983).

Memory for emotional events is an important area to examine for both the forensic implications of examining negative events, and for the mood enhancing qualities of recalling positive events (Pozzulo, 2013, Woods et al., 2005). Moreover, theorists argue that reflecting on emotional experiences is imperative for defining the self (D'Arembeau, Complain, & Van Der Linden, 2003), planning present actions, and predicting the future (Ochsner & Schacter, 2000). Autobiographical memories for emotional events are distinct from autobiographical memories for neutral events. Researchers have demonstrated that individuals recall more details of emotional experiences compared to memories for more neutral events (Christianson, 1992; D'Arembeau et al., 2003; Laney, Heuer, & Reisberg, 2004), a phenomenon known as the *emotional enhancement effect of memory* (Kleinsmith & Kaplan, 1963; Sharot & Yonelinas, 2008; Talmi, Anderson, Riggs, Caplan, & Moscovitch, 2008). In general, emotional autobiographical memories tend to be more richly encoded than neutral memories due to increased attention (Williams, Matthews, & MacLeod, 1996) and elaboration of emotion-rich material, as emotional experiences are more pertinent to important personal goals (Bower, 1992; Stein, Wade, & Liwag, 1997). As a result, emotional events tend to be thought about more often than non-emotional events (Schacter, 1996).

Given the numerous individual difference factors that influence children's recall of emotional events, an organizational framework is necessary to assist in the conceptualization of how and when these factors influence the retrieval process. Hervé and colleagues (2007) developed a *biopsychosocial theoretical model of eyewitness memory* to explain the effect of interactions between characteristics of the individual and the event on recall (Hervé, 2007; Yuille & Daylen, 1998). While Hervé and colleagues adapted this model for eyewitness application, they stressed that the model is wider in scope and is therefore applicable to memory for other emotional events. Hervé and colleagues advocate for a multidimensional approach to understanding individuals' reactions to emotional events, by examining social, psychological, and physiological processes that differ among individuals.

Hervé et al. (2007) proposed that differences in human memory are a result of the interaction between specific predisposing, precipitating, and perpetuating biological, psychological, and social factors. *Predisposing factors* include pre-existing, innate traits that influence how witnesses will respond to an event. Following the influence of predisposing factors, *precipitating factors* affect individuals at the time of the event and further shape memory construction. *Perpetuating factors* affect individuals' memory retention and reconstruction and may enhance or hinder retrieval ability. Hervé and colleagues propose that these factors affect memory by first influencing individuals' arousal sensitivity and second, their interpretive processes. They stress the importance of accounting for a variety of individual differences when examining emotional reactions to events and propose that emotional reactions, and the resulting memories, are influenced by the interaction of predisposing, precipitating, and perpetuating factors that may also overlap. That is, the factors are often, but not always, sequential. In children, these variables are influenced by developmental factors that affect many areas of functioning including information processing abilities, neurobiological maturity, expectations and interpretations of events as well as emotion regulation abilities (skills used for examining, evaluating, and adapting emotional responses to encourage goal attainment; Cichetti & Dawson, 2002; Marche & Salmon; 2013; Thompson, 2011).

1.1 Predisposing Factors

Predisposing factors include innate traits that exist prior to an emotional event, and affect the way children experience arousal and emotion in response to an emotional experience (Hervé et al., 2007). Predisposing factors include biological traits (e.g., arousal sensitivity, age), social

factors (e.g., arousal exposure, previous experiences), and psychological variables (temperament, attachment, child's affective state prior to the event) and are considered predetermined. Four of these variables that have been well supported to influence emotional event recall in children include: age at the time of the event (Fivush et al., 1995; Goodman, Quas, et al., 1997), gender (Davis,1999; Reese, Haden, & Fivush,1996), attachment (Kirsh, & Cassidy, 1997; Switzer, 2006; Alexander, Quas et al., 2002), and temperament (Gordon et al., 1993; Merrit et al., 1994; Switzer, 2006). The research on each of these predisposing factors will now be reviewed in turn.

1.1.1 Age. Children's memory for emotional events improves with age (Fivush et al., 1995; Goodman et al., 1997). As children develop, there are a variety of corresponding changes in many important information processing skills (e.g., faster encoding), in the flexible use of a variety of strategies, and in accumulated knowledge about the world (Kail, 1989; Ornstein, Baker-Ward, & Naus, 1988; Schneider & Pressley, 1997). These developmental differences are related to age-related differences in the efficiency of acquiring information; older children are provided increased opportunities for exposure to a wider range of stimuli than younger children, and older children acquire more knowledge from comparable exposure (e.g., Brainerd et al., 1985). As a result, given equal exposure to an event, older children are likely to demonstrate stronger memory traces than younger children (Ornstein, Baker-Ward, Gordon, & Merrit, 1997).

Memory researchers have discovered a number of other key variables that have been shown to explain memory improvement with age including age-related advantages attributable to neurobiological development, emotion regulation skills, children's ability to retrieve information, enhanced language abilities contributing to elaborated narratives which provide additional opportunities to express what is recalled, and increased understanding of social expectations inherent in an interview (Cicchetti & Dawson, 2002; Marche & Salmon, 2013; Ornstein et al., 1997; Ornstein, Ohlsson, Edmonds, & Aszatalos, 1991; Thompson, 2011). Developmental differences are evident in older children's ability to produce narratives that are more elaborated, coherent, and longer than younger children (Fivush et al., 1995; Goodman et al., 1997), particularly in free recall (Fivush, 1993; Saywitz & Snyder, 1996). However, with cued recall techniques, younger children can recall as much as older children (Saywitz & Snyder, 1996). Visual cues, in particular, have been found to be helpful to overcome developmental and language limitations (Brown & Pipe, 2003a; Comparo, Wagner, & Saywitz, 2001; Saywitz & Snyder, 1996).

Age also has a beneficial impact on perspective taking (Blakemore & Choudhury, 2006), which influences memory (Berk, 2000). The development of perspective taking skills influences how children understand and encode social interactions and has an impact on the information that children recall (Berk, 2000). By the age of five, children are able to provide a detailed narrative account of a personally experienced event (Fivish, 1993; Hudson & Shapiro, 1991). By this age, children also demonstrate perspective taking abilities or awareness of their own mental state (thoughts, desires, feelings, and motives) and the ability to ascribe the subjective mental state of others (Astington & Edward, 2010; Blakemore & Choudhury, 2006). Visual perspective taking skills, or the understanding that others can see stimuli in a different way, develop around four- or five-years- of age (Flavell, Everett, Croft, & Flavell, 1981). Perspective taking skills continue to expand as children develop and as children gain further understanding that people can interpret the same event in different ways (Berk, 2000).

Perspective taking skills are important in children's development of emotional autobiographical narratives (Fivush, 2011). When children understand and compare the ways in which they and others think and feel about events, they develop a subjective perspective or an ability to see themselves as having a unique perspective on personal past events. That is, by discussing the past with others through joint reminiscing, children develop a subjective sense of themselves through time (Fivush, & Nelson, 2006). Further, this joint reminiscing enables children to learn skills for creating increasingly connected and coherent narratives of past experiences that they may use in the construction of their personal timelines.

Perspective taking abilities are enhanced with the development of the brain (Blakemore & Choudhury, 2006). Results of functional neuroimaging studies have implicated the frontal and parietal cortices of the brain as responsible for perspective taking abilities (Blakemore & Choudhury, 2006; Ruby & Decety, 2001; 2004). These two brain regions have been consistently demonstrated to undergo substantial development throughout adolescence (Barnea-Goraly et al., 2005; Giedd et al., 1996; 1999; Pfefferbaum et al., 1994; Reiss, Abrams, Singer, Ross, & Denckla, 1996; Sowell, Thompson, Tessner, & Toga, 2001; Sowell et al., 2003). As a result, there is evidence of an increase in perspective taking abilities in adolescence (Choudhury, Blakemore & Charman, 2006). Consequently, autobiographical memory continues to develop in adolescence (Fivush, 2011). Thus, the content of adolescent autobiographical event recall likely contains more details about other people's subjective states than younger children's recall of

similar events. Taken together, the increase in knowledge base, neurobiological maturity, information processing abilities, emotion regulation skills, and enhanced social competency, including increases in perspective taking skills, all contribute to children's increased recall abilities with age (Choudhury et al., 2006; Cicchetti & Dawson, 2002; Marche & Salmon, 2013; Ornstein et al., 1988; Ornstein et al., 1997; Ornstein et al., 1991; Thompson, 2011).

1.1.2 Gender. Several studies suggest that female participants have enhanced autobiographical recall compared to males (for reviews see Andreano & Cahill, 2009; Piefke & Fink, 2005). For example, Davis (1999) performed a study asking children to recall different emotional autobiographical events. She reported that female children and adults recalled significantly more details than male participants across all ages and emotions. She also reported that females were faster at retrieving memories of emotional events. Reese and colleagues (1996) reported that female children demonstrated a tendency to report more information when being interviewed about a memorable, usually positive, event. There is some evidence however, that these differences may be a result of different cognitive strengths (St. Jacques, Conway, Lowder & Cabeza, 2011). For example, females demonstrate an advantage on verbal memory tasks whereas males demonstrate an advantage on spatial memory tasks (Andreano & Cahill, 2009; Piefke & Fink, 2005).

Conversations between children and parents about emotional events also contribute to gender differences in autobiographical recall (Zaman & Fivush, 2013). These conversations help children recognize patterns in emotional experiences and create schemas that facilitate interpretation, retrieval, and discussion in future situations (Fivush, 1993; Miller & Sperry, 1988). Additionally, these interactions may encourage children to discuss abstract thoughts of emotion and may encourage children to take the perspective of others (e.g., Vygotsky, 1962). Family conversations about emotional events are more elaborated with female children than male children (Zaman & Fivush, 2013) and may result in gender differences in reporting and retrieving these memories. All of these findings (Davis,1999; Reese et al., 1996) suggest that female children demonstrate more elaborate recall of emotional events than male children which may be due to differentiated cognitive retrieval strategies (St. Jacques et al., 2011) and/or early parent-child dialogue (Zaman & Fivush, 2013).

1.1.3 Attachment. Attachment also contributes to individual differences in children's autobiographical memory (Alexander & Edelstein, 2001; Kirsh & Cassidy, 1997). Like gender,

the attachment styles of parents and children also influence if and how parents and children talk about emotional experiences (Farrar, Fasig, & Welch-Ross, 1997), which may contribute to differences in the quality and quantity of details children report from their emotional autobiographical memories (Alexander, Quas et al., 2002). The characteristics of attachment relationships are therefore important individual differences to consider when examining children's recall of their emotional experiences.

Attachment theorists (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby 1980) propose that infants develop internal working models (IWMs) of relationships with their attachment figures (Bowlby, 1980). These IWMs are mental representations that consist of expectations regarding relationships that direct future behavior and are fairly resistant to change (Bowlby, 1973). Following Ainsworth and colleagues' (1978) research and several replications of the *strange situation* procedure (a laboratory experiment examining children's reactions to separation from parents and behavior when reunited with parents with and without a stranger present), four attachment styles among children were identified (Bowlby, 1988; Byng-Hall, 1995). The four attachment styles are termed: secure, avoidant, anxious/ambivalent, and disorganized (Ainsworth et al., 1978; Bowlby, 1988; Main & Solomon, 1986).

When caregivers adequately respond to their children's emotional needs, children develop a *secure* attachment style (Ainsworth el al., 1978). Securely attached children demonstrate distress when caregivers leave and enjoyment upon their return. Secure children are jovial with their parents and are encouraged to demonstrate age appropriate autonomy. Their caregiver interactions are characterized by warmth and children are encouraged to demonstrate anger when appropriate (Ainsworth el al., 1978; Byng-Hall, 1995; Cassidy & Shaver, 2008: Teyber, 2011). In contrast, when caregivers do not respond to children's cries or requests for affection, children develop one of three categories of insecure attachment (Teyber, 2011). When parents continually ignore, reject or refuse to console children, children develop an *avoidant* attachment style. Avoidant children are characterized by what appears to be independence or isolation, observed as a lack of concern from the child as the parent leaves. This isolation, however, is a coping mechanism used in an attempt to deactivate anxiety and feelings of insecurity.

Children described as *disorganized* have often experienced trauma, abuse or neglect and frequently contribute to the clinical population (Main & Solomon, 1986; Teyber, 2011). These

children do not seem to have an organized pattern or coping strategy to deal with their often disorganized caregivers. *Ambivalent* or resistant children attempt to stay close to their caregivers. They can be perceived as needy, clingy, and inconsistent and they often demonstrate anxiety as a result of inconsistently responsive or overprotective parenting (Ainsworth et al., 1978; Byng-Hall, 1995; Cassidy & Shaver, 2008; Teyber, 2011).

A number of studies have demonstrated a relationship between children's attachment security and their ability to recall positive and negative event information (Kirsh & Cassidy, 1997; Switzer, 2006; Alexander, Quas et al., 2002). Kirsh and Cassidy (1997) examined children's recall of stories containing attachment-relevant information, after identifying children's attachment style through the strange situation procedure. These stories were about children requesting care after an injury and contained differences in the parental response as corresponding to three different IWMs (secure, avoidant, ambivalent). They found that children with secure attachment demonstrated better recall for all types of stories, with the two insecure types demonstrating similar performance. These findings remained significant after controlling for differences in intellectual abilities between the children.

Alexander and Edelstein (2001) found similar results in an analysis of the relationship between attachment security and children's memory for an attachment-related story. They used a parent report measure (Attachment Q-Sort; Waters & Deane, 1985) to determine children's attachment security. They demonstrated that attachment security was a significant predictor of children's ability to recall the story whereby children demonstrating secure attachment recalled more details from the story.

Belsky and colleagues (1996) examined the association between attachment type and children's recall of positive and negative details witnessed in a puppet show. They also used the strange situation procedure to determine attachment security. They found that children who were classified as securely attached remembered positive experiences better than negative experiences. In contrast, children classified as insecure (i.e., avoidant and ambivalent) remembered the negative events better than the positive events.

To date, the literature that exists on the influence of attachment on memory has been limited to pre-school aged children (Alexander, Quas et al., 2002). Research is needed with older children because, while IWMs are first formed in infancy (Bowlby, 1982), children continue to rely on attachment figures and IWMs throughout childhood and adolescence (Bowlby, 1989).

Previous research on the influence of attachment on recall has also relied on observational and parental report measures, and there is a lack of studies that examine self-report measures of attachment. Self-report measures, such as questionnaires, allow a researcher to measure attachment security differences in children across a wider age range (Kerns, Aspelmeier, Gentsler, & Grabill, 2001; Van Ryzin & Leve, 2012). Further, using a different measure of attachment than those used in previous studies provides a more comprehensive examination of the construct as it allows for a broader sampling of the domain (Kerns, 2008).

Demonstrated differences in recall produced by attachment style may also be influenced by conversational topics and gender (Main, Kaplan, & Cassidy, 1985; Richardson & Ratner, 1999; Alexander, Quas et al., 2002). Children who demonstrate a secure attachment style present as more fluent and open in conversation than children with an insecure attachment style who avoid discussion of emotional or personal topics (Main et al., 1985; Richardson & Ratner, 1999). As a result, insecurely attached children may not appear to remember events that they do recall. Farrar and colleagues (1997) investigated the relationship between parent–child interactions and children's attachment security and demonstrated that gender may influence narrative elaboration. Parents completed the Q-sort to determine attachment security of their 3.5 - to 4.5-year-old children which was followed by researchers evaluating parent–child interactions through the discussion of two positive and two negative events. Farrar and colleagues reported that attachment security was related to increased elaboration in mother-daughter discussion across both types of emotional events but not across mother-son discussion.

1.1.4 Temperament. Temperament is another important individual difference that influences recall of autobiographical memories (Gordon et al., 1993). Temperament is described by Strelau (1987) as early developing, consistent individual differences in human behaviors that are influenced by a biologically determined set of predispositions. Temperament, according to Thomas and Chess (1977), is equivalent to the term "behavior style" and refers to how individuals behave rather than why behaviour occurs (motivation) or what behaviours take place (content). While there is some agreement concerning the general concept of temperament, there is notable disagreement among experts regarding an exact definition of temperament (Goldsmith et al., 1987; Kagan & Fox, 2006; Rothbart & Bates, 2006). Most current temperament researchers, however, would agree that early ontogenetic appearance, biological basis, and

moderate consistency are key components of a definition of temperament (Zentner & Bates, 2008).

Currently, the most comprehensive theory of temperament was introduced by Thomas and Chess (Thomas & Chess, 1977; Thomas, Chess, Birch, Hertzig, & Korn 1963). They sought to examine individual differences in children's temperament, and conducted the New York Longitudinal Study (NYLS) in 1956 and followed children from three months of age to adulthood. The NYLS was implemented as a result of the researchers' motivation to correct the strong "nurture" emphasis on development and focus instead on traits that were genetically based (Thomas & Chess, 1977). This study resulted in the identification of nine temperamental dimensions: (a) activity level, (b) rhythmicity (regularity), (c) approach/withdrawal, (d) adaptability, (e) sensory threshold, (f) intensity of reaction, (g) quality of mood, (h) distractibility, and (i) attention span/persistence.

Activity level refers to the level, tempo, and frequency of a child's motor activity and ranges from high to low motor activity (Thomas & Chess 1968). Rhythmicity refers to the degree of regularity of recurring biological functions, including eating, eliminating, sleeping, and waking. Children range from having regularity with these functions to displaying daily variability. Approach/withdrawal refers to a child's initial reaction to a new stimulus including people, places, procedures, toys, or food. Adaptability ranges from adaptable (fast) to unadaptable (slow) and is described as the sequential series of responses that a child makes to new or altered circumstances. Sensory threshold is an indicator of the level of external stimulation that is required to evoke a detectable response. Intensity of reaction refers to the energy content of a response to a stimulus, regardless of its direction (Thomas & Chess, 1986). Responses on this dimension range from mild to intense and may include any observable response (e.g., shouts, laughs) to positive or negative stimuli. Quality of mood ranges from negative to positive and is described as the amount of crying, unpleasant, unsociable behaviour contrasted with the amount of happy, pleasant, and sociable behaviour. Attention span/persistence refers to two interrelated subcategories. Attention span is described as the amount of time that a child engages in an activity. Persistence refers to the child's tendency to continue an action despite obstacles involved in its continuation. Distractibility refers to the ability of external stimuli to disrupt or alter a child's behavior and may be considered to be a component of persistence or task orientation in adolescence.

Since the seminal NYLS, many temperament assessment instruments have been developed based on the nine dimensional model of temperament (Carey & McDevitt, 1978; Fullard, McDevitt, & Carey, 1984; Martin, 1988; McDevitt & Carey, 1978; Thomas & Chess, 1977; Windle & Lerner, 1986) and much research has been produced on these measures. The measures were developed to assess temperament at various ages throughout the lifespan. The Temperament Assessment Battery for Children (TABC; Martin, 1988) based on Thomas and Chess' model (Presley & Martin, 1994) measures six of the temperament dimensions in children aged three to seven years namely activity, adaptability (flexibility/rigidity), approach/withdrawal, emotional intensity (mostly negative), and distractibility and persistence. However, when Presley and Martin (1994) conducted a factor analysis of the items on the TABC, a five factor solution provided the best fit to the data. These factors were labeled social inhibition (approach/withdrawal), negative emotionality, adaptability, activity level, and task persistence.

Gordon and colleagues (1993) used the TABC to examine the influence of temperament on children's recall for a typical medical visit. They reported that children who were rated by their parents as being higher on the approach dimension provided more elaborate responses to open-ended questions than children who were rated as having lower approach tendencies. They also reported that children who were rated as increasingly likely to express intense negative emotions provided more correct total recall than those rated as decreasingly likely to express intense negative emotion.

Merrit, Ornstein, and Spicker (1994) evaluated the impact of temperament on children's recall of an invasive medical experience (voiding cystourethrogram). They found that adaptability and approach-withdrawal were positively correlated with recall at the initial interview and after a 6-week delay. Further, these children were judged as demonstrating less fear during the procedure. Switzer (2006) also found increases in approach to be related to enhanced memory of inoculations in four- and five-year-old children. To date, there is a lack of literature that has examined the influence of temperament on children's recall of events throughout childhood. The majority of studies have also been limited to young children's recall of distressing events (Merrit et al., 1994; Rocha, 2003). As previously mentioned, there are benefits to examining recall of positive events, as this recall may have an influence on mood (Isen, 1985;1987; Rusting & DeHart, 2000). As such, it is important to examine the relationship between temperament and the number of details recalled from positive experiences.

Many studies have demonstrated that development has a beneficial impact on memory (Fivush et al., 1995) and given that temperament also influences memory, there is reason to believe that interactions between age and temperament may exist. It is important to examine whether the relationship between particular temperament dimensions and autobiographical recall varies as a function of age, as the current literature is lacking in this area.

The Revised Dimensions of Temperament Survey (DOTS-R; Windle & Lerner, 1986) was developed to assess temperamental dimensions across childhood as identified by Thomas and Chess (1977) in the NYLS (Windle, 1992) and it is the only temperament assessment tool that assesses temperament in preschool age children through adolescence. Conceptual comparison of the TABC and the DOTS-R reveal that both instruments measure five similar temperament dimensions or factors (Martin, Wisenbaker, & Huttunen, 1994; Presley & Martin, 1994; Windle, 1992), thus allowing comparisons to be made between the existing literature and the current study.

In a review of several factor analyses completed on Thomas and Chess' model (1977), Martin and colleagues (1994) reported that across studies, evidence for seven factors has emerged. These factors include the five factors identified by Presley and Martin (1994) as well as two controversial factors, rhythmicity and threshold (Martin et al., 1994). Ruch, Angleitner and Stelau (1991) reported in another factor analytic study that the DOTS-R accounts for variance not accounted for by other temperament measures, specifically, the rhythmicity scales. Further, Angleitner and Ostendorf (1994) reported similar results and speculated that rhythmicity may be particularly important for young children. As such, given the DOTS-R's more comprehensive coverage of important factors and its applicability to a wide age range, the DOTS-R was used in this study.

1.1.5 Attachment and Temperament. Attachment and temperament both influence children's recall performance and the two constructs share a complex relationship that has sparked some debate in the literature (Goldsmith & Harman, 1994). Goldsmith and Harman (1994) proposed that this debate was a result of both temperament and attachment theories being developed to address emotion and emotional development in a different manner. That is, attachment pertains to the emotional relationship shared between a child and a caregiver while temperament pertains to individual emotionality. Both theories take different approaches to examine related constructs to explain emotional behavior.

Traditional attachment theorists (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1980) propose that interpersonal relationships are structured as a result of internal working models, resulting from early parental interactions. They believe that parental responsiveness is the primary influence on attachment behaviour and temperament is only capable of influencing the quality of a caregiver's behavior (Sroufe, 1985; Sroufe & Waters, 1977). They maintain that the relationship between the caregiver and child generates the attachment behaviors observable in the Strange Situation. Strong advocates of attachment theory declare the concept of temperament outdated (Sroufe, 1985), noting an obsolete emphasis on genetic differences. Bowlby (1969a) proposed that secure attachment behaviors also promoted increased genetic selection due to close infant–parent proximity which led to increased chances of survival.

Temperament theorists (Strelau, 1987; Thomas & Chess, 1977) emphasize the role of individual differences in human behaviors. Early temperament theorists proposed that children's behaviors in the strange situation procedure were a function of children's temperament rather than attachment classifications (Fox, Kimmerly, & Shafer, 1991; Kagan, 1982). They suggest that children who demonstrate high levels of reactivity and withdrawal will exhibit distress in the Strange Situation (Fox et al., 1991; Kagan, 1982). Thomas and Chess (1977) introduced the concept of "goodness-of-fit" to explain the importance of the relationship between children's temperament and parental expectations. Goodness of fit is demonstrated when an individual's characteristics and behavioral style meet the environmental demands and expectations at any given time. According to Thomas and Chess, the quality of the attachment relationships between parents and children is dependent upon the compatibility of both parties' actions, responses, personality features, and expectations.

Despite long lasting debates between temperament and attachment theorists (Goldsmith & Harman, 1994; Kagan, 1984; Alexander, Quas et al., 2002; Vaughn & Bost, 1999), there have been some theorists that suggest that the two are related (Bowlby, 1969b; Braungart & Stifter, 1991). Bowlby (1969b) suggested that temperament and attachment may interact to guide development. In recent years gains have been made in demonstrating that both factors have a considerable influence on personality and on each other. Braungart and Stifter (1991) reported that temperament correlates with subtypes of attachment security and insecurity. Hane and Fox (2006) demonstrated that supportive home environments that promote secure attachment both contribute to temperamental inhibition and assist in regulating infant emotional reactivity. Meany

and colleagues' (2001) work with rodents has demonstrated the critical role of care giving in influencing stress reactivity and has sparked some agreement among temperament and attachment researchers regarding the importance of a supportive home environment. Additionally, the influence of temperament on parenting styles is becoming increasingly accepted (van Ijzendoorn & Bakermans-Kranenburg, 2012).

Most studies examining the relationship between attachment and temperament have utilized the Strange Situation or the Attachment Q-Set (Switzer, 2006; Teti, Nakagwa, Das, & Wirth, 1991; Wachs & Desai, 1993; Waters & Deane, 1985), measures restricted to use with young children. Moreover, correlational studies with preschool children that examine the predictive value of attachment and temperament on recall have produced mixed results (Switzer, 2006; Alexander, Goodman et al., 2002; Alexander, Quas et al., 2002). Some studies have reported weak correlations between attachment and temperament and minimal effect sizes (Goldsmith & Alansky, 1987; Vaughn et al., 1992), while others have found stronger correlations (Wachs & Desai, 1993).

Switzer (2006) performed a correlational study utilizing the Q-Set and the Behavioural Style Questionnaire (BSQ: McDevitt & Carey, 1978) to examine the predictive abilities of attachment and temperament in four- and five-year-old children's recall for stressful events. She reported that while several temperament dimensions were related to attachment, several temperament dimensions and attachment security did not contribute to the predictive model. Sensory threshold was the only temperament dimension that had any predictive power for stressful event recall. In a review of the topic, Vaughn and Bost (2000) concluded that while temperament and attachment are related, the strength of the relationship varies based on assessment instruments. Thus, researchers must take caution in drawing conclusions across measures. Currently none of the studies that exist have examined the influence of attachment and temperament on recall across a wide age span, despite consistent empirical support that recall abilities improve with age (Howe, 1991), which may influence findings in these areas. Age may prove to be a moderator in the relationship between attachment and some dimensions of temperament. However, there are no temperament measures that exist to measure sensory threshold in adolescence. Further studies examining the relationship between temperament, attachment and recall are necessary as more information is needed on how the two constructs account for unique and shared variance in the recall of autobiographical memories. If the two

constructs independently predict event recall, then findings will inform the literature, suggesting that the two are not related. However, if a correlation is demonstrated, this may provide further support for an important relationship between attachment and temperament.

In summary, children who demonstrate secure attachment show enhanced recall of attachment relevant information (Alexander & Edelson, 2001; Kirsh & Cassidy, 1997) and a tendency to recall positive events better than negative events, while insecurely attached children demonstrate a tendency to recall negative events better than positive events (Belsky, et al., 1996). This research however has been limited to young children (Alexander, Quas et al., 2002). Studies examining the relationship between temperament and children's recall of emotional events have found that children who score higher on the approach (Gordon et al., 1993; Merrit, et al., 1994; Switzer, 2006), negative emotionality (Gordon et al., 1993), and adaptability (Merrit, et al., 1994) dimensions of temperament demonstrate enhanced emotional event recall compared to children who score lower on these dimensions. Studies examining the relationship between attachment and temperament have produced mixed results (Switzer, 2006; Alexander, Goodman et al., 2002). This relationship has yet to be examined across a wide age range of children and is an issue that is addressed in the current study.

1.2 Precipitating Factors

Precipitating factors, as introduced by Hervé and colleagues (2007), include biological (e.g., arousal, substance use), psychological (e.g., valence, anxiety) and social factors (e.g., feelings of personal safety, social support) that are characteristics of the specific emotional event and follow or interact with predisposing factors to influence memory formation. One important precipitating factor that influences memory formation is the emotion experienced during the event.

Autobiographical memories for emotional events contain a wide range of emotions. Emotions are often described as containing two components: *emotional valence* (how positive or negative the emotion is) and *emotional arousal* (Ford, Addis, & Giovanello, 2012; Talarico, et al., 2009). Arousal varies on a continuum from calm to excitement (Bradley & Lang, 1994; Dolcos, Labar, & Cabeza, 2004) and may be characterized by physiological arousal (Talarico et al., 2009). Emotion is distinguishable from *affect*, which refers to the subjective, conscious qualities of emotions that are considered exclusive of bodily sensations (Marche, Briere, & von Baeyer, 2011; Melzack & Torgerson, 1971; Melzack & Wall, 1996; Merriam-Webster Collegiate

Dictionary [MWCD], 2000; Ornstein et al., 1999). *Anxiety* is a related concept that can be defined as an unpleasant state characterized by both physiological arousal as well as unpleasant affect, including the subjective, conscious qualities of worry, fear, and apprehension (Bourne, 2006; Freud, 1936; Watson & Kendall, 1989; Wesley, 1988). Anxiety is thus characterized by negative valence as well as heightened arousal and is often a component examined in many studies of children's recall for emotional events due to its implications for eyewitness testimony. Emotional arousal exists on a continuum from calm to excitement and is associated with physiological changes within the body and is a component of both emotion and anxiety (Dolcos et al., 2004; Quas & Lench, 2007).

Research findings examining the impact of the different components of emotion on memory are mixed, with some studies demonstrating that positive valence has a beneficial impact on autobiographical memory (Talarico et al., 2009), while others suggest that negative emotion is more beneficial to memory than neutral or positive emotion (Berntsen, 2002; Goodman, 2006; Howe, 2007). Similarly, research on the influence of arousal on autobiographical memory has been inconsistent with some researchers supporting a negative influence of arousal (e.g., Bahrick, Parker, Fivush, & Levitt, 1998; Bugental, Blue, Cortez, Fleck, & Rodriguez, 1992; Merritt et al., 1994), while others have reported a positive influence of arousal (Alexander, Quas et al., 2002; Goodman, Hirschman, Hepps, & Rudy, 1991), or no influence (e.g. Vaandermass, Hess, & Baker-Ward, 1993).

Discrepancies in findings are undeniably influenced by the complications related to the disentanglement of emotional valence and arousal in studies that are not word-list studies conducted in a laboratory (e.g., Brainerd et al., 2010). Another possible reason for the inconsistent findings of the effect of emotion on memory is that individual differences in memory for emotional events have not been taken into account (Goodman et al., 1997; Marche & Salmon, 2013), including gender (Salmon et al., 1995; Steward, 1993), attachment (Alexander, Quas et al., 2002; Alexander & Edelstein, 2001; Kirsh & Cassidy, 1997) and temperament (Gordon et al., 1993) as listed above. Some of the available literature that exists on emotional valence, emotional arousal and memory will be reviewed next, with a focus on studies that have sought to separate these components.

1.2.1 Valence. Although the findings regarding the influence of emotional valence on autobiographical memory are mixed (Alexander, Quas et al, 2002; Bugental et al., 1992;

Goodman, et al., 1991; Merritt et al., 1994), the majority of recent research has provided support for an enhancing effect of positive valence (Bernsten, 2002; D'Argembeau, Comblain, & Van Der Linden, 2003; Raspotnig, 1997). Talarico and colleagues (2004) reported that participants reported positive memories as more vivid than negative memories. D'Argembeau, Comblain, and Van Der Linden (2003) found similar results, whereby positive memories were rated as more detailed than negative and neutral memories. Individuals also generally recall more positive than negative autobiographical memories voluntarily (Meltzer, 1930) and involuntarily (Bernsten, 1996), known as the Pollyanna Principle (Matlin & Stang, 1978), a phenomenon that increases with age (Reed & Carson, 2012).

Memories of positive and negative events also contain qualitative differences (Bernsten, 2002; Talarico et al., 2009). Adult studies have shown that positive event memories result in increased recall of peripheral (irrelevant) details compared to central (relevant) details (Bernsten, 2002; Talarico et al, 2009). Other researchers report that positive event memories contain more contextual and sensory details than negative memories (Destun & Kuiper, 1999) and neutral memories (D'Argembeau, et al., 2003). Fivush and colleagues (2003) also found qualitative differences in children's (5-12 years of age) recall of emotional events that were rated as positive or negative by their caregivers. They examined children's reports of these experiences and found that children provide narratives that are more descriptive and contain more details about objects and people when recalling positive experiences than negative experiences.

The recall of positive memories may be enhanced for many reasons. People may frequently rehearse and elaborate more positive information, causing them to retrieve more positive information than negative information (D'Argembeau, et al., 2003; Denny & Hunt, 1992; Taylor & Brown, 1988). This may be particularly relevant to children, who engage in increased discussion of positive emotions relative to negative emotions with parents (Sales, Fivush, & Peterson, 2003). Positive valence may also stimulate and activate existing schemas (organized patterns of thought) which may cause an individual to recall more emotion relevant and related information (Clore & Storbeck, 2006). Individuals may also be motivated to recall more positive events as positive events serve a social function, enabling individuals to bond (Rasmussen & Berntsen, 2009).

While the enhanced recall of positive events appears to be established (D'Argembeau, et al., 2003; Destun & Kuiper, 1999), there is also an enhancing influence of negative valence on

some components of autobiographical recall (Fivush et al., 2003). Children's recall of negative experiences includes more detail about thoughts and emotions and children describe negative experiences more coherently compared to positive experiences (Fivush et al., 2003). Bernsten reported that negative events, associated with high arousal, inspire tunnel memories (Bernsten, 2002), or memories containing more central details than peripheral details (Bernsten, 2002; Talarico et al., 2009), a tendency not found in positive event memories. However, there is also support that the tendency to report central details is related to vividness in highly arousing memories, regardless of valence (Butler & Wolfner, 2000; Christianson & Hubinette, 1993).

Currently, research examining children's recall of emotional events is limited and has largely focused on adult's memory for emotional experiences (Davis, Quas, & Levine, 2008). Research on the emotional valence of specific autobiographical events has commonly utilized self-report measures where participants rate their valence using a questionnaire containing a Likert-type scale (Talarico et al., 2009). For example, Talarico and colleagues (2009) utilized the Autobiographical Memory Questionnaire (AMQ; Rubin, 2006) to measure valence in their study with adults. This questionnaire requires individuals to rate the emotional valence associated with the event, from extremely negative (-3) to extremely positive (3), and intensity, from not at all intense (1) to extremely intense (7). Children receive academic instruction on the concept of negative numbers in grade six, around the ages or 11 or 12 (Kilhamn, 2011). Thus, the AMQ will not prove useful with populations under this age. Some studies that exist on children's memory for these events have utilized parental reports of emotion (e.g., Fivush et al., 2003). Parent report may not be the most reliable measure of valence, however, as children may hide their true feelings or parents may interpret their children's behavioural patterns incorrectly. In the current study, we utilized a self-report measure completed by the child in an effort to obtain children's subjectively experienced degree of emotion in response to an event.

1.2.2 Arousal. As noted above, Hervé and colleagues (2007) propose that arousal has a fundamental and often underemphasized influence on memory for emotional events. According to one of the earliest theories of arousal, the Yerkes-Dodson Law (Yerkes & Dodson, 1908), arousal and performance share a curvilinear relationship. That is, arousal enhances memory until arousal reaches an optimal level, at which point, additional increases in arousal have detrimental effects. Easterbrook's (1959) cue utilization hypothesis suggests that physiological arousal contributes to a narrowing of attention, which results in a reduction in the range of cues that can

be attended to. Easterbrook sought to explain the Yerkes-Dodson law by proposing that, at states of optimal (moderate) arousal, cue-utilization assists in narrowing an individual's attention to the most important or central aspects of an event at the expense of the less relevant information. This narrowing effect is a result of arousal restricting the variety of cues that can receive focus by reducing individuals' ability to employ parallel processing (ability to engage in multiple cognitive tasks simultaneously). Easterbrook further suggested that at extreme levels of arousal, attention is so restricted that not even central details are recalled.

Recent reviews have suggested that the Yerkes-Dodson law, as well as the cue-utilization hypothesis, may not be applicable to memory for emotional events (see Christianson, 1992, for review). Christianson (1992) reviewed numerous findings that suggest that high arousal is beneficial to recall of the central details of a negative emotional event. That is, increases in arousal enhance an individual's focus on the more relevant details of an event, while the peripheral details receive less focus. Thus, Easterbrook's (1959) hypothesis has received some support in terms of a narrowing effect of arousal on recall; however, Easterbrook demonstrated that the attention is narrowed to central details. This narrowing of attention to central details has been referred to as *tunnel memories* (Safer, Christianson, Autry, & Österlund, 1998). Tunnel memories have not been found in studies examining emotionally arousing, positive memories; however, which suggests that the narrowing of attention is caused by an interaction between negative valence and high arousal (Bernsten, 2002).

Research on children's recall for emotional events has produced ample studies examining arousal for negative events in comparison to studies examining the impact of arousal on recall for positive experiences. The studies that are available examining arousal for positive events typically include events associated with low arousal (e.g., family gathering; Fivush et al., 2003). Thus, there is a need for research on relationships between variable levels of arousal and recall for positive events.

The literature on the impact of arousal on children's recall for stressful, or negative events, is inconsistent. Numerous studies report a positive relationship between stress and memory (Alexander, Quas et al., 2002; Goodman et al., 1991; Quas, Carrick, Alkon, Goldstein, & Boyce, 2006; Quas & Lench, 2006), while others have reported negative relationships (e.g., Bugental, et al, 1992; Merritt et al., 1994; Quas, Bauer, & Boyce, 2004) or no relationship (e.g., Vaandermaas, Hess, & Baker-Ward, 1993). While there are considerable differences in findings

of children's recall of stressful situations, there appears to be some support for qualitative differences. For example, Peterson and colleagues have performed a series of studies examining children's recall of stressful medical experiences, and reported that children recall the central aspects of these events in great detail (Peterson, 1999; Peterson & Bell, 1996; Peterson & Whalen, 2001). Children demonstrated considerable recall of central and peripheral details of the injury and subsequent hospital treatment with high accuracy (Peterson & Whalen, 2001). Similar to adult findings (Christianson, 1992), children recalled central details better than peripheral details five years following the injury and older children demonstrated better recall than younger children.

A number of explanations exist for the inconsistent findings of the influence of arousal on children's recall for stressful events. One explanation is methodological differences. The target event may range from mildly arousing laboratory events (e.g., Bugental et al., 1992; Peters, 1991) to highly stressful medical procedures (e.g., Goodman et al., 1991; Quas et al., 1999). Another possible reason for the inconsistent findings is variability in how arousal is measured. Some studies utilized observer or parental report measures of stress (Goodman et al., 1991; Quas & Lench, 2007). These measures are useful objective measures of distress; however, they may not accurately portray children's arousal (Quas & Lench, 2007). As noted above, children may mask their true feelings or parents may misinterpret their children's behavioural patterns. Another method utilized to measure arousal is physiological stress responses. While autonomic responses are less susceptible to attempts to appear calm, and to observer misinterpretation, autonomic responses may result from novelty as well as physical activity and may produce confounding results (Wallin, Quas, & Yim, 2009).

Limited studies have included children's self-report of arousal at encoding, despite the possibility that it may resolve some of the above issues. Self-report may also provide additional knowledge regarding the influence of children's subjective view of arousal on recall. Researchers that had utilized children's self-report noted confusion in rating arousal and a tendency to rate arousal at extremes (Fivush et al., 2003). Thus, efforts at addressing arousal must ensure explicit and carefully constructed instructions and measures to ensure understanding of this construct before attempts can be made to measure it. Numerical rating scales (NRS) have demonstrated utility and versatility in self–report with children above six years of age (Cardno & Kapur, 2002). NRS have been utilized to measure pain (Cardno & Kapur, 2002; Graumüller &

Laudien, 2003; Williamson & Hoggart, 2005) and anxiety (Crandall, Lammers, Senders, Savedra, & Braun, 2007); however, they can be adapted to any construct that can be considered on a continuum from the absence (e.g., no pain at all) to the extreme (e.g., most pain imaginable). Children are only required to understand the concept of numbers and order.

1.3 Perpetuating Factors

Hervé and colleagues (2007) describe perpetuating factors as variables that influence individuals' recall following a specific event that increase or decrease the quality and quantity of the memory. The three types of perpetuating factors identified by Hervé et al. are biological variables such as neurocognitive functioning at the time of recall, psychological variables such as affect at the time of recall, and social factors such as the recall context (factors specific to the environment where recall takes place). Examples of these factors include interview methods aimed at assisting individuals' recall of events (e.g., cued recall) and specific instructions that influence the manner in which memories are obtained (e.g., recall perspective). These two perpetuating factors will be described in turn.

1.3.1 Interview Methods.

The Narrative Elaboration Technique (NET; Saywitz & Snyder, 1996) is a memory enhancement interviewing technique that was developed in an effort to increase the number of memory details that children can recall without compromising the accuracy of the information. It is grounded in empirical research that has demonstrated that children benefit from using retrieval strategies (Flavell, 1970; Paris, Newman, & McVey, 1982; Saywitz & Snyder, 1996), including visual cues to assist in providing additional details that would otherwise have gone unreported (Nelson, 1986). Visual cues have been argued to be a less suggestible method to gather information when compared to direct questioning and may assist in overcoming developmental and language difficulties (Brown & Pipe, 2003a; Comparo et al., 2001; Saywitz & Snyder, 1996).

The NET procedure requires the use of four generic pictorial cue cards that depict line drawings which represent people, actions, settings, and conversation/affective states to encourage enhanced event recall (Saywitz & Snyder, 1996). The interview technique begins with rapport building, followed by training that defines and describes the type of information each card aims to elicit. Children are then given an opportunity to practice using the cards before they are asked to present information about the target event. Following training, children are prompted for free recall to tell as much as they can remember about what happened. Finally,

children are presented with each cue card and are asked if they can remember anything else. Children are given the option to say "no" or they "don't remember" or "don't know" and the next card is presented.

Results of studies examining the NET are promising. The NET has demonstrated success in assisting children (4 - 15 years of age) with recalling accurate details of an event without increasing the number of inaccurate details recalled (Bowen & Howie, 2002; Brown & Pipe, 2003a; Brown & Pipe, 2003b; Camparo, Wagner, & Saywitz, 2001; Dorado & Saywitz, 2001; Roeber & Beuscher, 2004; Saywitz & Snyder, 1996). The NET can also assist younger children (7 – 8 years of age) to report at the same level as older children (10 - 11 years of age; Saywitz & Snyder, 1996).

The NET is an effective interview technique; however, researchers suggest that there are other important components of autobiographical memory which may not be completely accessed by the NET (Marche et al., 2011; Ornstein et al., 1997). Autobiographical memories are recollections of personal experiences that refer to the people, the place, the objects, and the actions inherent in the recalled event (Kleinknect & Beike, 2004). Autobiographical memories are tied to the self, influenced by emotions and are specific to time and place (von Baeyer, Marche, Rocha, & Salmon, 2004). Therefore, autobiographical memories involve at least six different components: (a) contextual/temporal, (b) sensory/somatosensory, (c) procedural, (d) behavioral, (e) cognitive, and (f) affective/emotional (Kleinknect & Beike, 2004; Ornstein et al., 1997; von Baeyer et al., 2004).

The *contextual/temporal component* of autobiographical memory relates to details recalled about the setting, environment or the interrelated conditions in which the event occurred (e.g., location, time and state of objects, people or groups; Marche et al., 2011; MWCD, 2000). The contextual/temporal component, given its non-verbal nature, may provide cues for retrieval of sensory/somatosensory information (Ornstein, Manning, & Pelphrey, 1999).

The *sensory/somatosensory* autobiographical memory component refers to various bodily sensations (Melzack & Torgerson, 1971; Melzack & Wall, 1996; MWCD, 2000) associated with the experience. These sensations are generally experienced through the five senses (i.e., sight, smell, taste, touch, sound) and include information about the quality and intensity of the sensation (e.g., color, brightness, clarity, volume; Marche et al., 2011). The sensory/somatosensory component also includes somatosensory information about bodily states

(MWCD, 2000; Melzack & Torgerson, 1971; Melzack & Wall, 1996; Ornstein et al., 1999) that are not received through the five senses (e.g., itch, pain, posture, balance; Marche et al., 2011) and autonomic reactions (e.g., nausea). The sensory component of autobiographical memory was not directly cued by developers of the NET.

The *procedural* autobiographical component involves contextual information that describes how an activity was conducted and by whom (Marche et al., 2011; MWCD, 2000). The procedural component encompasses information about a procedure (e.g., steps required to perform an activity) and sequence of the events (e.g., first, then). The *behavioral* component relates to information surrounding the manner in which individuals acted during the experience, or details regarding a response to stimulation or action/reaction (MWCD, 2000). The collective responses, actions, reactions or movements that unfolded during the event are all characteristics of the behavioural autobiographical memory component (Marche et al., 2011).

Cognition refers to the process or act of knowing, encompassing both judgements and awareness (MWCD, 2000). Cognition may also be defined as thought processes (Sternberg, 2009). The *cognitive* autobiographical component therefore refers to the mental process or personal dialogue that an individual recalls taking part in as well as the expectation, anticipation, and afterthought specific to the event. The cognitive component is another component of autobiographical memory that was not directly cued by developers of the NET.

As noted above, emotions contain two components; emotional valence (how positive or negative the feeling is) involves a conscious mental interpretation and influence while emotional arousal is associated with physiological changes within the body (Ford et al., 2012; Talarico et al., 2009; Dolcos et al., 2004). Emotion is distinguishable from *affect*, which refers to the subjective, conscious qualities of emotions that are considered exclusive of bodily sensations (Marche et al., 2011; Melzack & Torgerson, 1971; Melzack & Wall, 1996; MWCD, 2000; Ornstein et al., 1999). The *emotional/affective* component of autobiographical memory therefore refers to emotional and affective details of various types or intensity.

Marche and colleagues (2011) sought to enhance the NET by encompassing all of the components of autobiographical memory listed above by designing the *Comprehensive Narrative Elaboration Technique* (CNET). Like the NET, the CNET is an interview protocol which first requires training on the use of the cards, followed by free recall and then requires the use of eight pictorial cue cards. The NET cards were utilized as a template for creating eight cards (i.e.,

place, time, thoughts, feelings, sayings, actions, senses, & people) to elicit information on each memory component, or a combination of components. The CNET, like the NET, is administered at the time of recall to increase the quantity and subjective quality of the memory details reported by children.

1.3.2 Recall Perspectives. Varying recall perspective is another perpetuating factor that influences recall of autobiographical memories. Nigro and Neisser (1983) found that people recall experiences from two different perspectives, the observer and the field perspective. When recalling an experience from an observer perspective, individuals adopt the position of an onlooker, observing themselves in the remembered scene. The field perspective refers to individuals perceiving the memory again through their own eyes, exactly as it occurred. Nigro and Neisser found that individuals tended to choose the observer recall perspective to report memories that were rated as having a higher degree of self-awareness, social anxiety or threat. For example, individuals would choose to use the observer perspective to describe public presentations or fleeing from danger. The observer perspective also tended to be adopted for memories that occurred further in the past. They found that field memories were more likely to evoke emotions and this perspective was used with more recent memories. Nigro and Neisser suggested that people may deliberately choose to adopt a field recall perspective when trying to recall how they felt during an emotional experience.

Robinson and Swanson (1993) provided further support for increased reports of affect in the field perspective. They examined individuals' ability to switch recall perspectives with instruction and found that a switch in perspective from field to observer caused a decrease in affect, including a decrease in affect intensity and awareness (e.g., "I am remembering my feelings at the time"). These decreases were not found when perspective change occurred in the opposite direction. They proposed that an individual's choice in recall perspective is influenced by differences in the type of knowledge accessible. That is, individuals may choose to use the field perspective for recall where their goal is to have affective as well as cognitive components, such as goals and beliefs, accessible.

McIssac and Eich (2002; 2004) demonstrated further influences of vantage point on recall in adult university participants and individuals with post-traumatic stress disorder. They found that recall reported in the observer perspective produced more detailed descriptions of scenes, including more information about participants' personal appearances and actions as well as

spatial layouts. However, a field perspective inspired recall that was more affect laden, with increased reports of physical sensations and psychological states. McIssac and Eich (2004) also found that traumatic memories recalled from an observer perspective were described by participants to be less anxiety provoking and emotional than field memories. Similar studies examining the effect of recall perspective on memory have been conducted with adolescent populations (Hignette & Cartwright-Hatton, 2008). Hignette and Cartwright-Hatton (2008) did not analyze the number or type of memory details recalled but they found that youth also demonstrate an increased tendency to retrieve memories using the observer perspective as social anxiety increases.

D'Argembeau and colleagues (2003) conducted a study to examine which recall perspective was associated with positive, negative and neutral events in undergraduate participants. They predicted that participants would utilize a field perspective to recall positive memories more often than negative memories as people would be more hesitant to focus on the affect associated with negative memories and, as a result, should utilize the observer perspective to recall negative events. This would, therefore distance themselves from the memory (Nigro & Neisser, 1983).

D'Argembeau and colleagues (2003) asked participants to recall two positive experiences, two negative experiences and two neutral experiences. Their instructions explicitly indicted that participants were to choose an event where they experienced these emotions, rather than an example rated as positive, negative and neutral by the researchers. If several events came to mind, the participants were instructed to choose the most intense memory that came to mind; arousal was not measured. They were also instructed to choose an event that had occurred in the 12 months prior to data collection. Participants then rated their memory, based upon the Memory Characteristics Questionnaire created by Johnson, Foley, Suengas, and Raye (1988), for amount of sensorial, cognitive, emotional, and contextual detail. The results demonstrated that positive memories contained more sensory and contextual details while negative memories obtained higher ratings for clarity of time and neutral memories were rated as containing more details pertaining to smell. The researchers also found that the field perspective was utilized significantly more often than the observer perspective. Additionally, both positive and negative events were increasingly recalled using the field perspective while neutral memories were more often recalled using an observer perspective. These results are consistent with previous research

that demonstrated that field memories are generally more affect laden than observer memories (McIssac & Eich, 2002; 2004; Nigro & Neisser, 1983).

D'Argembeau and colleagues (2003) did not find differences between preferences for recall perspectives based upon the emotional valence of the event; however, they described an implemented time restriction (in the last 12 months) as a possible contributing factor. They concluded that this restriction may have resulted in a poorly defined condition, resulting in detailed negative memories being avoided as the details were not useful to perform the task. Moreover, this restriction may not have allowed participants to pick their most salient or arousing memory which is the second component of emotion, in addition to valence, that may influence which perspective an individual utilizes in recall. The authors recommended that future researchers employ specific questions about a particular event participants have experienced in an effort to overcome this limitation. Additionally, utilizing a measure of arousal will allow for a more comprehensive examination of the relationship between emotion and recall perspective.

Gender differences also influence which recall perspective is chosen. Huebner and Fredrickson (1999) sought to test Fredrickson and Roberts' (1997) hypothesis that, as a result of society's tendency to sexually objectify women's bodies, women would utilize the observer perspective more than men. Huebner and Fredrickson asked male and female adult participants to recall one asocial and three social situations that were likely to promote sexual objectification (e.g., university party) and to identify the perspective they naturally use to recall the memory. They reported that women were more likely than men to use the observer perspective to recall all of the reported events and, in particular, the university party. Women also reported increased negative affect and anxiety in recalling this event, compared to men. They theorized that their findings may be due to women being increasingly conscious about their personal appearance in comparison to men.

Continuity or discontinuity of the self appears to be another influence in an individual's choice to recall using the field or observer recall perspective (Libby & Eibach, 2002). An individual's everyday experiences are characterized by a feeling that one is a unique agent or entity with one's own identity, a feeling referred to by Tagini and Raffone (2010) as the 'self.' Libby and Eibach (2002) theorized that discontinuity of the self, or discrepancies in the way one views one's 'past self' as opposed to one's current self, would result in the individual utilizing the observer perspective to recall memories of one's past self. They state that discrepancies in an

individual's past self and current self may result from transformation due to life altering events (e.g., cancer diagnosis, addiction recovery). An individual recalling actions or experiences that are congruent with one's current self will utilize the field perspective. They reported findings consistent with this theory in their 2002 study. As individuals get older, they have increased opportunity for exposure for life-altering events. Given increased opportunities for children to experience discrepancies between how they view their current and past self, as well as an increase in perspective taking abilities, it is likely that as children age, their use of the observer recall perspective will increase.

Given the evidence regarding the qualitative differences in adults' memories recalled from a field or observer perspective (McIsaac & Eich, 2002; 2004; Nigro & Neisser, 1983), as well as differences found among adolescent populations (Hignette & Cartwright-Hatton, 2008), there is a need to examine whether such differences exist in the child population. Children are often called upon to testify as eyewitnesses and the observer perspective has been shown to elicit more information about personal appearances, actions, and spatial layouts. This information may be crucial to eyewitness testimony and person identification (Pozzulo, 2013). Moreover, eliciting this information while decreasing children's recall of physical sensations and psychological states may prove to be more comfortable for children and it may save police resources by decreasing time spent in forensic interviews.

1.4 The Current Study

1.4.1 Purpose. Following decades of research in this area, it is clear that a number of variables influence children's recall of autobiographical events, including: age (Fivush et al., 1995; Goodman, et al, 1997), gender (Fivush, 1993; Salmon et al., 1995), attachment (Alexander, Quas, et al., 2002), temperament (Gordon, et al., 1993; Merritt et al., 1994), emotional valence (Ford et al., 2012), and emotional arousal (Ford et al., 2012). However, how these variables predict and interact to influence recall throughout development is unknown. It is also clear from adult studies that the recall perspective an individual utilizes for memory retrieval results in qualitative differences in the details recalled of emotional events (Nigro & Neisser, 1983). Researchers have demonstrated that observer recall results in more detailed descriptions of scenes, more information about participants' personal appearances and actions as well as spatial layouts, while field recall is more affect laden, with increased reports of physical sensations and psychological state (McIsaac & Eich, 2002; 2004). However, information on the

impact of recall perspective on children's event memory is unavailable. Finally, researchers examining the NET have demonstrated that it has great promise in assisting children to recall more details about emotional events without compromising accuracy, however, a more comprehensive interview technique has yet to be empirically examined in this area and may facilitate improved recall of more of the components of autobiographical memory than the NET. In the event that the CNET is more effective at eliciting key details from children concerning their emotional events, this interview technique may be a beneficial perpetuating factor to implement in forensic interviewing. Additionally, if recall perspective produces similar qualitative differences with children, the findings will have important forensic and treatment implications, informing professional practice.

1.4.2 Research objectives, questions, and hypotheses. This study was developed to address three objectives by examining nine research questions. Each of the study objectives are listed in turn, followed by the research questions used to address each objective, and each question is followed by the associated hypotheses. The first purpose of this study was to determine the manner in which individual factors that exist before, during, and following an event combine to predict children's recall of emotional autobiographical events and which factors account for the most variance. Relationships between recall perspectives and children's overall event recall were not examined as researchers have demonstrated no experimental effect of recall perspective on the number of details that individuals recall (McIsaac & Eich, 2002; 2004).

1) How do predisposing (age, gender, attachment, temperament) and precipitating (emotional valence, emotional arousal) factors account for shared and unique variance in recall and what is the relative importance of each variable?
   a) Age, gender, attachment, temperament, emotional valence and emotional arousal were all expected to be significant predictors of children's recall of emotional events. It was anticipated that female children would demonstrate enhanced recall compared to male children and increases in age, attachment security, temperament scores (i.e., approach, adaptability, quality of mood), positive valence, and arousal were expected to be associated with an increased number of details recalled from past events.

b) Previous researchers found that all six variables are important in predicting children's recall of emotional events; however, the relative importance of each of the variables has not been examined and was a unique contribution of this study. Consequently, there is no research available from which to derive hypotheses. Thus, no hypotheses of the relative importance of the variables were presented.

2) Are emotional valence and arousal (precipitating factors) significant predictors of recall ability over and above age, gender, attachment and temperament (predisposing factors) and what is the unique contribution of emotional valence and arousal to the amount of variance accounted for in children's recall, when controlling for age, gender, attachment, and temperament?
   a) Given that emotional valence and increased arousal have been associated with increased recall in several studies, it was anticipated that both precipitating factors would be significant predictors of recall over and above predisposing factors.
3) Does the type of interview (CNET, NET) administered to children result in significant differences in the number of emotional event details recalled?
   a) Children who were administered the CNET were expected to recall more event details than children who were administered the NET.
4) How do predisposing (age, gender, attachment, temperament), precipitating (emotional valence, emotional arousal), and perpetuating (recall perspective, interview type) factors account for shared and unique variance in each of the six memory components: (a)contextual/ temporal, (b) sensory/somatosensory, (c) procedural, (d) behavioral, (e) cognitive, and (f) affective/emotional, which variables account for the most variance, and how do these factors interact?
   a) Previous research has demonstrated that emotional valence and arousal, as well as recall perspective and interview type, are variables that can be used to predict recall of details in each of the six memory components. However, similar to the first proposed research question, the relative importance of each of the variables has not been examined and is a unique contribution of this study. Consequently, there is no research available from which to derive hypotheses. Thus, no hypotheses of the relative importance of the variables were presented.

b) Emotional valence was expected to be a significant predictor of the number of contextual, cognitive, sensory, and affective/emotional details recalled; memories characterized by increased ratings of positive valence were expected to be associated with increased recall of contextual and sensory details while increases in negative valence were expected to be associated with increased recall of cognitive and affective/emotional details.

c) Recall perspective was expected to be a significant predictor of the number of contextual/temporal, behavioral, procedural, cognitive, emotional/affective, and sensory/somatosensory details recalled; it was anticipated that children who recall from the observer perspective would recall more contextual/temporal, behavioral, and procedural details than children who utilize the field perspective and children who recall from the field perspective would produce more cognitive, affective/emotional, and sensory/somatosensory details than children who utilize the observer perspective.

d) Interview type was expected to be a significant predictor of the number of sensory/somatosensory and cognitive details recalled; it was anticipated that children who were interviewed using the CNET would recall more sensory/somatosensory and cognitive details of the event than children who were interviewed using the NET.

e) A valence x perspective interaction on the number of contextual, cognitive, and affective/emotional details recalled was anticipated; increases in recall of contextual details due to positive valence were expected to be significantly more pronounced when the observer recall perspective was used. Increased recall of cognitive and affective/emotional details due to negative valence were expected to be significantly less pronounced when the observer recall perspective was used.

5) How do predisposing (i.e., age, gender, attachment, temperament), precipitating (i.e., emotional valence, emotional arousal), and perpetuating (i.e., recall perspective, interview type) factors account for shared and unique variance in recall of central and peripheral details, which variables account for the most variance, and how do these factors interact?

a) Previous research has demonstrated that emotional valence and arousal (i.e., precipitating factors) can be used to predict recall of central and peripheral details; however, similar to the first research question, the relative importance of each of the variables has not been examined in conjunction with predisposing and perpetuating factors and is a unique

contribution of this study. Thus, no hypotheses of the relative importance of the variables was presented.

b) A valence x arousal interaction was anticipated; increases in recall of central details due to negative valence were expected to be greater for memories characterized by increased arousal.

6) Are attachment and temperament related, do they account for shared and unique variance, and which is a stronger predictor of children's recall for emotional events?
   a) It was anticipated that attachment and temperament would be significantly correlated and they would account for shared variance in children's recall of emotional events.
7) What is the influence of attachment security and the valence associated with the event on children's recall of emotional events?
   a) A main effect of valence was anticipated; children were expected to recall positive events in more detail than negative events.
   b) A valence x attachment interaction was expected; it was anticipated that securely attached children would recall positive experiences significantly better than their negative experiences; insecurely attached children were expected to demonstrate the opposite pattern.

The second objective of this study was to examine how gender, emotion, age of the memory, and age of the child predict the recall perspective children use to retrieve emotional memories.

8) Are the emotional valence and arousal of the memory, the age of the memory, and the age and gender of the child significant predictors of the recall perspective naturally used to recall positive and negative events?
   a) Valence was expected to be a significant predictor of recall perspective ratings; memories rated as more positive were expected to be associated with increased observer perspective ratings.
   b) It was anticipated that age would be a significant predictor of recall perspective ratings; increases in age were expected to be associated with higher observer perspective ratings.
   c) Age of the memory was expected to be a significant predictor of recall perspective ratings; more distant events would be associated with increased observer perspective ratings while more recent events would be associated with increased ratings of field recall.

d) A valence x arousal interaction on recall perspective ratings was anticipated; negative event memories rated high in arousal were expected to be associated with higher ratings of observer recall.

The third objective was to determine whether field and observer recall perspectives differ in terms of the amount of anxiety experienced during recall.

9) Does children's field and observer recall differ in terms of the degree of anxiety experienced during recall?

a) A main effect of recall perspective was anticipated; children were expected to report greater levels of anxiety when using the field perspective for recall compared to the observer perspective.

Chapter 2. METHOD

2.1 Participants

One hundred children (8 - 17; M_{Age} = 12.35, SD = 3.36) participated in the study. Participants consisted of 51 young children (8 - 12; M_{Age} = 9.29, SD = 1.50, 20 boys) and 49 adolescents (13 - 17; M_{Age} = 15.53, SD = 1.50, 18 boys). Children were recruited by convenience sampling in Alberta and Saskatchewan; the majority of children were recruited from schools in rural Saskatchewan. Other participants were recruited by convenience sampling due to parent association with the author. The sample was predominantly Caucasian (90% of European origin, 6% Aboriginal, 2% Asian/Pacific Islander, 1% African Canadian, 1% Hispanic/Latino). One (8-year-old) male participant was removed from the analyses due to a failure to follow instructions.

2.2 Materials

2.2.1 Recruitment Packages. Principals of various schools within the Sun West School District and the Lutheran Collegiate Bible Institute in Outlook, Saskatchewan were contacted via email to request permission to recruit participants within their schools. Recruitment packages that were sent to parents included a letter of invitation from the researcher (Appendix A), a parental consent form (Appendix B), an age appropriate child recruitment brochure (Appendix C), and a standard parent-report demographic questionnaire (Appendix D).

2.2.2. Attachment Security Scale (ASS; Kerns, Klepac, & Cole, 1996; see Appendix E). The ASS is a self-report questionnaire that was created to assess children's perceptions of security in both the mother - child and father - child relationships. Items on the ASS assess the level to which children believe a particular attachment figure is available when needed, their tendency to depend on the attachment figure when upset and children's desire to communicate with attachment figures (Granot & Mayseless, 2001). The ASS consists of 15 items that are rated using a 4 - point scale based on Harter's (1982) ''Some kids . . . other kids. . .'' format (Kerns et al., 1996). Attachment security scores range from 15 to 60, whereby higher scores indicate a more secure relationship. A score of 45 and over is used to indicate a secure attachment relationship while scores 44 and below indicate an insecure attachment relationship. The ASS has demonstrated adequate internal consistency (Cronbach's α = .72 - .84; Gronot & Mayseless, 2001; Kerns et al., 1996) with children 9.5 - 11.5 years of age. Kerns and colleagues (1996) demonstrated that the ASS has both convergent and discriminate validity; they reported

significant correlations with the degree of emotional support received from mother (Kerns et al., 1996), r = .70, father, r = .48, and friends, r = .49, as well as with self-worth, r = .40, peer acceptance, r = .30, behavioural conduct, r = .36, and scholastic competence, r = .38, using Harter's (1988) Perceived Social Support Scale. The ASS did not correlate significantly with athletic competence using Harter's (1982) Self-Perception Profile for children, nor did the ASS demonstrate a significant correlation with grade point average (GPA) based on school records (Kerns et al., 1996). The ASS scores were also significantly correlated with mothers' reports from Block's (1965) Q-sort regarding their acceptance of the child and their motivation to provide a secure base for the child. Kerns and colleagues further demonstrated a test-retest correlation (14 days) of .75, demonstrating some stability of children's perceived security. Additional studies (Dwyer 2005; Kerns, Schlegelmilch, Morgan, & Abraham, 2005) have noted test-retest correlations over a three-year interval (8 to 10 or 11 years) to be statistically significant as well, although caution must be used in interpreting test-retest correlations given rapid changes in development (Berk, 2013; Spencer, Bornholt, & Ouvrier, 2003).

Van Ryzin and Leve (2012) examined the validity of the ASS with adolescents and found that the ASS was significantly correlated with observed mother-adolescent interactions, as coded on the Autonomy and Relatedness Coding System (ARCA; Allen et al., 2003), in times of conflict. The ASS was also significantly correlated with social competence as rated by teachers, r = .14, demonstrating predictive validity. The ASS was also predictive of scores on the Adult Attachment Scale (i.e., depend, anxiety, and close; Collins & Read, 1990), when measured three years later, demonstrating convergent validity. In summary, the ASS has been found to be a reliable and valid measure of attachment security in children as young as eight years of age (Dwyer 2005; Kerns et al., 1996; Kerns et al., 2005) to adolescents (Van Ryzin & Leve, 2012).

2.2.3 The Revised Dimensions of Temperament Survey (DOTS-R; Windle & Lerner, 1986; Appendix F). The DOTS-R is a 54-item questionnaire designed to measure temperament in children from preschool to adolescence. There are two forms of the DOTS-R; the DOTS-R (SELF) is designed to be administered to children while the DOTS-R (CHILD) is designed to be completed by the primary caregiver for the child. Items are rated on a four point scale from usually false (1) to usually true (4), including some reverse scored items. Ten, factor analytically derived, temperament dimensions are measured by the DOTS-R, namely: (a) activity level - general, (b) activity level - sleep, (c) approach/withdrawal, (d) flexibility, (e) mood quality, (f)

rhythmicity - sleep, (g) rhythmicity - eating, (h) rhythmicity - daily habits, (i) distractibility, and (j) persistence. Higher scores on the activity level scales indicate increased activity levels in general and during sleep. Higher scores on Approach/Withdrawal are associated with an increased tendency to approach a new stimulus (e.g., people, places, items). Higher scores on Flexibility/Rigidity indicate a more flexible or adaptable behavioural style. Higher scores on the Mood scale indicate a more positive quality of mood. Higher scores on the rhythmicity scales indicate more regularity of sleeping behaviour, eating behaviour, and daily habits (i.e., eating, resting, eliminating). Higher scores on Task Orientation indicate increased persistence and reduced distractibility. Test-retest correlations for adolescent children have been found to range from .59 to .75 across an interval of six weeks (Windle & Lerner, 1986). Internal consistency of individual scales (e.g., Windle, Iwawaki, & Lerner, 1987; Windle & Lerner, 1986) indicate acceptable levels of reliability for research purposes (Chronbach's alphas ranged from .53 - .91; Windle & Lerner, 1992). Further, Windle (1992) found significant inter-rater agreement across caregivers and adolescents, demonstrating convergent validity for the DOTS-R consistent with prior research on parent-child agreement (e.g., Kazdin, French, Unis, & Esveldt-Dawson, 1983; Lyon & Plomin, 1981) and other temperament research (e.g., Rothbart & Goldsmith, 1985). The majority of the research with the DOTS-R was completed with adolescents, including the psychometric research; however, the DOTS-R (SELF) has been used successfully with children 10 - 12 years of age (Blackson, Tarter, Loeber, Ammerman, & Windle, 1996; Blackson, Tarter, & Mezzich,. 1996) and the DOTS-R (CHILD) has been used with children as young as four (Antshel, et al., 2006; Windle & Lerner, 1986).

2.2.4. Numerical Rating Scale (NRS-11). The numerical rating scale is a bipolar, 11 point rating scale ranging from 0-10 where 0 represents the absence of a target feature (e.g., pain) and 10 represents the greatest amount possible. Numerical rating scales have been demonstrated to be effective for rating pain with children as young as six-years-old (Solodiuk et al., 2010; von Baeyer, et al., 2009). Anchors on the NRS-11 were adapted to measure positive and negative valence, as well as arousal, anxiety, and degree of field or observer perspective (Appendix G).

2.2.5. Narrative Elaboration Technique (NET: Saywitz & Snyder, 1996; Appendix H, I). The NET is an interview protocol where, following free recall, four pictorial cues are presented to children to help remind children of details that they may not have reported. The cues represent people, actions, settings, and conversation/affective states to encourage enhanced event

recall. The NET has been successful in assisting children with recalling accurate details of an event without increasing the number of inaccurate details recalled (Bowen & Howie, 2002; Brown & Pipe, 2003a; Brown & Pipe, 2003b; Camparo, Wagner, & Saywitz, 2001; Dorado & Saywitz, 2001; Roeber & Beuscher, 2004; Saywitz & Snyder, 1996). The NET can assist younger children (7 – 8 years of age) to report at the same level of detail as older children (10-11 years of age; Saywitz & Snyder, 1996).

2.2.6 Comprehensive Narrative Elaboration Technique (CNET; Marche et al., 2011). The CNET is an adapted version of the NET. Children are given training on how to use the CNET, incorporating the same eight pictorial cues (i.e., place, time, thoughts, feelings, sayings, actions, senses, & people; Appendix J) to elicit information on each memory component, or a combination of components., card descriptions training narrative (Appendix K) used in Marche et al.'s (2011) study to encourage children to report additional information on six different memory components. Children's narratives were also coded for information according to these six memory components.

2.3 Procedure

Recruitment packages were delivered to various Principals in rural Saskatchewan and to parents who indicated an interest through advertisements on social media (i.e., Facebook) and through verbal advertisement. Principals met with the researcher to ask questions and parents were invited to call the researcher at their convenience (i.e., Alberta and Saskatchewan telephone numbers were provided) with questions or concerns. Following parental consent, the researcher met typically with a group of approximately five children and began rapport building by asking questions not pertaining to the study (e.g., favorite thing to do, favorite subject in school, best friends, favorite sports, etc.). When the participants appeared comfortable, the researcher obtained assent by reading the child assent form (Appendix L) aloud to the participants. The assent forms were then signed by the researcher.

Children were next administered the ASS and the DOTS-R in counterbalanced order. Children were provided with the measures and the researcher read the questions aloud and invited participants to circle any items they were not confident with, to be reviewed in individual testing sessions. Children were invited to provide a preferred time to return for the individual session and were excused following completion of the measures.

Children returned for the individual sessions at their preferred time, and assent was reconfirmed. Any items that children found unclear on the questionnaires were clarified with children by the researcher. Next, the study was introduced by saying: "We will be doing a number of things at this time. First I will ask you to pick four memories or events to tell me about right now and you will also tell me the same ones later." Participants were then asked to provide their brief descriptions (i.e., event description) for two happy and two unhappy memories. Event descriptions were recorded on the data recording sheet (Appendix M). The order of event memory elicitation was altered according to the child's counterbalanced assigned condition and the script was modified. For example, to elicit positive memories the researcher used the following script:

> "I am going to ask you to pick two happy memories. These different memories may have happened over a period of minutes or hours but it must be one single event. It is also very important that you were happy the whole time the event was happening and it makes you happy now. During our happy memories we have different levels of excitement. Sometimes we are calm and other times we are not very calm. Sometimes we are very excited, so excited that you might feel it in your body where you have lots of energy. I would like you to choose one happy memory where you were very excited and one happy memory where you were only a little excited, then we will rate your feelings. Take some time to think of two happy memories you would like to tell me about. Tell me when you are ready."

The participants were given approximately two minutes to provide a memory. If children were unable to provide a memory (3% of sample), the researcher provided some examples, which were effective for all three participants:

> "Some children have told me about a birthday party, or a trip away from home like camping or a trip somewhere special, but it is important that YOU actually FELT happy. Does that help you think of a memory?"

Brief event descriptions were recorded on the data recording sheet. To elicit negative memories, the following script was used:

> "Now I am going to ask you to pick two unhappy memories. You can tell me about any kind of unhappy event that you would tell a stranger. It can be a time when you felt

scared, mad, sad or any other unhappy emotion. It is very important that you were unhappy the whole time the event was happening. During our unhappy memories we have different levels of calmness. Sometimes we are calm and other times we are not calm at all. Sometimes we are so nervous, scared, mad or sad that we can feel it in our bodies where we have lots of energy or our bodies just feel different. I would like you to choose one unhappy memory where you were very calm and one memory where you were not very calm, then we will rate your feelings. It is very important here that you do not tell me anything that you would not tell a stranger like a doctor or dentist. I want to remind you again that if you tell me that there are children, including you, being hurt by someone else I would have to report that to somebody else to get you or them help. Take some time to think of two memories you would like to tell me about. Tell me when you are ready."

Examples were provided as necessary:

"Some children have told me about a trip to the doctor or dentist, others have told me about when their pet died, but it is important that YOU actually FELT unhappy. Does that help you think of a memory?"

After brief event descriptions were recorded, participants rated their valence using the NRS-11 scales. The researcher introduced the scales using the following script:

"I would like to know how you were feeling when (event description). So I will ask you a few questions using these scales. I will ask you to rate three different scales to help me understand. Are you ready?"

The general valence scale was introduced by the researcher: *"*On a scale from zero to ten where zero is the most unhappy possible and ten is the most happy possible, how would you rate how you were feeling at that time?" The NRS scale for positive events (i.e., events that were rated greater than 5) was introduced by the researcher saying: "This scale is just like the last one, except this time, zero means not happy at all, so this may mean that you are just feeling like you normally do, or neutral and ten is again, the most happy possible." The negative event scale required first obtaining a valence description: "What would you call that unhappy feeling that you felt when (event description). Some examples of unhappy feelings are sadness, anger, and

scared, but there are others. What would you call your feeling?" Most children did not require examples of unhappy feelings. Children's answers were then written in the blank space on the NRS-11. The researcher then introduced the negative valence NRS-11 by using each child's provided word: "This scale is just like the last one, except this time, zero means not (the researcher read the valence description aloud) at all, so this may mean that you are just feeling like you normally do, or neutral, and ten is the most (valence description) possible."

Next, the arousal NRS-11 was introduced to the participants by the researcher with the following script:

> "Remember how I just told you that we have different levels of calmness at different times. Sometimes we are very calm and at other times we are very excited or scared. When we are very excited or scared we have lots of energy in our bodies, sometimes people feel their hearts beat faster or they breathe faster; these people would have more energy. How would you rate how much energy you had on this scale where ten is the most energy possible, and zero is no energy at all?"

For the few participants who struggled to provide an example of one event that was rated less than five on the arousal NRS-11, and one event that was rated greater than five, participants were cued to choose another positive or negative memory as necessary. The same instructions were repeated and shortened, based on participants' understanding, for all four of their memories.

Following valence and arousal ratings for all memories, the field and observer perspective were introduced to the children using laminated cards (Appendix N) depicting first person and third person views from a video game (IGN, 2014). The researcher said:

> "There are two different views that people use to remember events. One way that people remember an event is called the first-person point of view, like someone is looking through their own eyes, just like when it happened. Another way that people remember is called the third-person point of view. The third-person view is like remembering the event through someone else's eyes. Using this view you can see yourself in your memory. Let's look at these pictures. See, if this first one was a memory, we would call it a first- person point of view because the person here can't see himself. He can see his hands, just like we can see our hands right now, but he can't see the top of his head or his back. He is remembering it just like it happened. If the second picture was this man's

same memory, we would call it a third person point of view because the man can see himself, his whole body, like he is seeing it through someone else's eyes. We can't see the top of our heads when we are running, so he must be remembering it like he is outside his body.

The researcher then asked participants to indicate which view they usually use to recall each memory and the participants' answers were recorded. Next, participants rated each of their memories on the NRS-11 to obtain a rating for the degree of field and observer perspective naturally used by the children:

"I would like you to use these rating scales to tell me how you usually remember the time (event condition). How would you rate your view on this scale where ten is the most first-person possible and zero is not first person at all?"

Participants also rated the same memories for the degree of observer perspective naturally used to provide an opportunity to check the children's understanding of the view points as opposites. The same instructions were repeated and shortened, based on participants' understanding, for all four of their memories.

A protocol was prepared in the event that a child exhibited or reported excessive duress during data collection, in an effort to reduce distress and harm that may result from negative event recall. Only one participant disclosed discomfort with recalling a sad memory. This participant was offered an opportunity to discuss a new memory or withdraw from the study. The participant was also directed to the school guidance counselor. This participant chose to recall a new memory and indicated that she left the study area in a positive mood and reported that she would connect with the school counsellor if she felt sad at a later time.

The recall portion of this study varied depending on participants' randomly assigned conditions (see Appendix O for details regarding counterbalancing). Participants received training on cued recall with the CNET (Appendix J, K) or the NET (Appendix H, I), depending on their assigned conditions. Participants were also asked to utilize a previously chosen, assigned recall perspective, following an additional, brief description. Participants' narratives were audio recorded and later transcribed. Following the study, children were thanked for their participation and a small reward was provided for participation. Children were provided debriefing forms (Appendix P) to bring home to parents.

Transcriptions were coded by the researcher and a research assistant using the component definitions (Appendix Q) adapted from those used by Marche and colleagues (2011) and described above. It is important to note that the sentences recalled can be classified as including details from more than one component of memory. For example, the sentence "the doctor gave me a candy right after we were done" contains procedural information (right after), behavioural (gave me), and contextual details (the doctor, me, candy). In order to make a central or peripheral content distinction, the coding description utilized by Peterson and Whalen (2001), initially introduced by Heuer and Reisber (1992), defining central details as plot relevant and peripheral details as plot irrelevant, was used. That is, coders determined whether the details provided made a significant impact in understanding the event (i.e., central) or whether they could be left out without changing the main content of the narrative (i.e., peripheral). Peripheral and central details were summed to provide a measure of the total number of details recalled by children for each memory.

Chapter 3. RESULTS

3.1 Inter-rater Reliability

Following transcription, narratives were coded for type of memory component details and central or peripheral distinctions. A research assistant coded 35% of the 100 cases used in the study for memory component details and central and peripheral details. Prior to an evaluation of the distributions (Tabachnick & Fidell, 2013), an inter-rater reliability analysis using the Kappa statistic was completed to determine consistency among coders. Inter-rater reliability for the coding of memory details was assessed on twelve percent of participant memories to obtain the Kappa statistics presented in Table 3.1. That is, both coders coded 12% of participant memories, and inter-rater reliability was assessed for agreement in the coding of memory component details and central and peripheral details for 12 participants.

Table 3.1

Inter-Rater Reliability Kappa

Memory number and detail type	Kappa (Std. Error)
Memory 1 Total Details	.733 (.127)
Memory 2 Total Details	.733 (.127)
Memory 3 Total Details	.818 (.113)
Memory 4 Total Details	.821 (112)
Total Contextual Details Memory 1	.833 (.107)
Total Contextual Details Memory 2	.835 (.104)
Total Contextual Details Memory 3	.835 (.104)
Total Contextual Details Memory 4	.753 (.121)
Total Procedural Details Memory 1	.636 (.137)
Total Procedural Details Memory 2	.914 (.082)
Total Procedural Details Memory 3	.824 (.112)
Total Procedural Details Memory 4	.832 (.106)
Total Behavioural Details Memory 1	.752 (.120)
Total Behavioural Details Memory 2	.833 (.107)
Total Behavioural Details Memory 3	.834 (.106)
Total Behavioural Details Memory 4	.833 (.105)
Total Cognitive Details Memory 1	.912 (.083)
Total Cognitive Details Memory 2	.753 (.121)
Total Cognitive Details Memory 3	.830 (.107)
Total Cognitive Details Memory 4	.837 (.105\)
Total Sensory Details Memory 1	.800 (.127)
Total Sensory Details Memory 2	.914 (.082)
Total Sensory Details Memory 3	.683 (.142)
Total Sensory Details Memory 4	.910 (.086)
Total Affective Details Memory 1	.819 (.114)
Total Affective Details Memory 2	.913(.082)
Total Affective Details Memory 3	.742(.124)
Total Affective Details Memory 4	.818 (.112)

Note. All analyses were significant at the $p < .001$ level.

All of the produced Kappa statistic values exceeded Cohen's cut off for substantial inter-rater agreement (Marston, 2010). After examining the inter-rater reliability, the data set was screened for normality (Tabachnick & Fidell, 2013). The histograms for all 40 dependent variables were examined for skewness, kurtosis, and outliers. Several of the distributions were displayed on histograms with a large majority of responses at the lower end; this tendency was most apparent in the memory component detail distributions. This positive skew reflects children's natural predisposition to report no or few details for some of the memory components. Several explanations exist for this tendency. Firstly, there are a number of reasons to explain

why children may have reported fewer memory component details, including published differences found due to age (Fivush et al., 1995), gender (Fivush, 1993), attachment (Alexander et al., 2002), temperament (Merritt et al., 1994), emotional valence (Fivush et al, 2003), emotional arousal (Peterson & Whalen, 2001) as well as several others. Secondly, children were not graded on their event recall or rewarded for increased recall, and may not have been motivated to produce details for each memory component. Thirdly, participants were not aware that memory components were evaluated independently as variables in this study, and were therefore not aware of the importance of reporting details for each memory component. Finally, the absence or presence of memory component details from children may reflect the types of details that naturally come to mind for children when reporting their experiences.

Distributions of some of the variables also demonstrated great variability and some outliers. This variability across participants was expected and reflective of individual differences in children's even recall (Leichtman, Cic, & Morse, 1997; Pipe & Salmon, 2002; Quas, Goodman, Ghetti, & Redlich, 2000) and therefore no outliers were removed from the data set.

3.2 Research Questions 1 and 2

To assess how predisposing (i.e., age, gender, attachment, temperament) and precipitating (i.e., emotional valence, emotional arousal) factors account for shared and unique variance in recall and the relative importance of each variable, Pearson product-moment correlation coefficients were examined to assess the strength and direction of the relationships between each of the factors and the recall of the total number of details within each memory. Cohen's (1992) descriptions of correlational strength were used to guide interpretations of relationships. Continuous variables were labeled small, medium, and large when they approached $r = .10$, $r = .30$, and $r = .50$, respectively. Relationships between one continuous and one dichotomous variable were described utilizing Rice and Harris' 2005 extension of Cohen's guidelines as small, medium, and large as they approached $r = .10$, $r = .24$, and $r = .37$ respectively. Significant bivariate predictors were entered into a multiple regression analysis. Therefore, a mix of theoretical (i.e., identifying relevant candidate variables) and empirical (i.e., entering only significant predictors) approaches were used to identify the variables included in the analyses. Regression was chosen given the multitude of continuous variables and limitations that are present when analyses are limited to two levels of independent variables (Field, 2013). That is, regression analyses are conducted using continuous variables, allowing for increased variability

compared to ANOVAs and therefore increased power to detect significant relationships. Further, most of the variables analyzed were not manipulated in the laboratory and are therefore not appropriate for causal analyses (Tabachnck & Fidell, 2013). Descriptive statistics for the predisposing and precipitating factors examined in questions 1 and 2 are presented in Table 3.2.

Table 3.2

Descriptive Statistics

Variables	*M(SD)*
Age	12.35 (3.36)
Attachment	49 (7.7)
Temperament	
Activity Level General	18.9 (4.7)
Activity Level Sleep	11.4 (3.7)
Approach/Withdrawal	18.6 (3.8)
Flexibility/Rigidity	14.2 (3.3)
Mood	23.8 (4.8)
Rhythmicity-Sleep	15.3 (3.7)
Rhythmicity-Eating	13.5 (2.9)
Rhythmicity-Daily Habits	11.9 (4.6)
Task Orientation	20 (4.6)
Mem1Valence	8.99 (1.03)
Mem1Positive Valence	8.59(1.58)
Mem1Arousal	8.58(1.25)
Mem2Valence	6.91 (1.37)
Mem2Positive Valence	6.35 (1.79)
Mem2Arousal	3.30 (.99)
Mem3Valence	1.16 (1.50)
Memory 3 Negative Valence	7.89 (1.99)
Mem3Arousal	7.97 (1.55)
Mem4Valence	2.37 (1.45)
Memory 4 Negative Valence	6.01 (2.48)
Mem4Arousal	2.77(1.21)

3.2.1 Memory 1: Positive valence, high arousal. Correlations are displayed in Table 3.3. Approach/withdrawal was significantly and positively correlated ($p = .005$) with the total number of details recalled in memory 1, suggesting that children with an initial tendency to approach a new situation recalled more details for memories with positive valence and high arousal. Flexibility/rigidity ($p = .010$), mood ($p = .0026$), and rhythmicity-daily habits ($p = .023$) were all variables that were also positively related to the total number of details, indicating that children with a more positive quality of mood, behavioural flexibility or adaptability, and increased regularity in recurring biological functions (e.g., require rest, experience hunger, elimination) recalled more details in memory 1. All effect sizes in this analysis were small, with approach tendencies on the verge of a medium effect.

Table 3.3

Correlations for Memory 1 (Positive Valence, High Arousal)

	G [b]	AS [b]	AG [b]	AS [b]	A/W [b]	F/R [b]	M [b]	RS [b]	RE [b]	RD [b]	TO [b]	V	PV	A	Details Recalled
Age	.25*	-.23*	-.11	.25*	.08	.18	.30**	.08	.13	.20*	-.11	-.03	.12	.03	.13
Gender[a]		-.15	-.18	.01	-.11	.14	.18	.05	-.01	.14	-.04	-.21*	.01	-.05	.10
Attachment Security			-.13	-.29**	.18	.130	.27**	.07	.27**	.25*	.21*	-.09	-.05	.16	.20
Activity Level General				.07	.01	-.16	-.25*	-.05	-.25*	-.14	-.35***	.17	.08	.04	.05
Activity Level Sleep					-.11	-.15	.12	-.09	-.07	-.05	-.24*	.16	.10	.09	.03
Approach/Withdrawal						.13	.28**	.07	.24*	.25*	.19	.13	.09	.21*	.28**
Flexibility/Rigidity							.31**	.06	.04	.05	.11	-.20*	-.16	-.02	.26*
Mood								.08	.32**	.35***	.06	-.01	.03	.09	.22*
Rhythmicity-Sleep									.38***	.31**	.28**	-.03	.01	-.09	.11
Rhythmicity-Eating										.48***	.39***	-.11	.23*	-.05	.15
Rhythmicity-Daily Habits											.18	-.11	.23*	-.09	.23*
Task Orientation												-.03	.06	.00	.13
Valence													.44***	.37***	.16
Positive valence														.21**	.13
Arousal															.06

Note. N = *99*

* = p < *.05*

** = p <*.01*

*** = p <*.001*

G = Gender, AS = Attachment, AG = Activity Level General, ALS = Activity Level Sleep, A/W = Approach/Withdrawal, F/R = Flexibility/Rigidity, M = Mood, RS = Rhythmicity-Sleep, RD = Rhythmicity-Daily Habits, RE = Rhythmicity-Eating, TO = Task Orientation, V= valence, PV = positive valence, A = arousal

[a] *Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables*

[b] *Correlations between predisposing factors will not be presented for the remaining memories as they are stable across memories and dependent variables*

Regression coefficients for memory 1 are presented in Table 3. For memory 1, the temperament dimensions in the regression model accounted for a significant amount of variation in children's recall. Flexibility/rigidity (3.8%) and approach/withdrawal (3.5%) accounted for a significant amount of unique variance in children's recall. Rhythmicity-daily habits and mood accounted for 1.9% and 0.2 % of the variance in children's recall for memory 1, respectively.

Table 3.4

Predisposing Factors in the Prediction of Details Recalled for Memories with Positive Valence and High Arousal

Variable	*b*	*SE*	β	*p*	*sr*	sr^2
Approach/Withdrawal	.5.16	2.62	.20	.05	.187	.035
Flexibility/Rigidity	6.08	2.95	.21	.04	.195	.038
Mood	.1.08	.2.23	.05	.63	.046	.002
Rhythmicity-Daily Habits	.5.10	3.46	.15	.15	.139	.019
	R = .39, R^2 = .12, *F* (4,94) =4.27, *p* = .003					

Note. N = 99

3.2.2 Memory 2: Positive valence, low arousal. Correlations of factors are presented in Table 3.5. Rhythmicity-daily habits was positively and significantly associated (p = .001) with total details reported by participants for memory 2 with a medium effect size demonstrated. This relationship indicates that children with increased regularity in recurring biological functions recalled more details from memories with positive valence and low arousal than children with less regularity. Age (p = .013), approach/withdrawal (p = .025), and flexibility/rigidity (p = .023) were all variables that were associated with total details reported by participants in memory 2 with small effect sizes obtained, communicating that older children, children who tend to approach a new situation, and children who demonstrate increased flexibility recalled more details in memory 2.

Table 3.5

Correlations for Memory 2 (Positive Valence, Low Arousal)

	Valence	Positive Valence	Arousal	Details Recalled
Age	-.03	-.09	.08	.25*
Gender	.05	.03	.03	.19
Attachment Security	.04	.02	.03	.14
Activity Level General	.18	.14	.01	-.03
Activity Level Sleep	-.04	-.01	-.01	.03
Approach/Withdrawal	.01	-.01	.03	.23*
Flexibility/Rigidity	.10	.12	.11	.23*
Mood	.04	-.05	.05	.16
Rhythmicity-Sleep	-.07	-.06	.14	.08
Rhythmicity-Eating	-.13	.12	.10	.13
Rhythmicity-Daily Habits	-.03	.06	.12	.32**
Task Orientation	-.11	-.28**	.06	-.02
Valence		-.20	-.28**	.03
Positive Valence			-.20*	.03
Arousal				.10

Note. $N = 99$

* = $p < .05$

** = $p < .01$

Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables

Regression coefficients are presented in Table 3.6. The temperament dimensions in the regression model for memories with positive valence and low arousal accounted for a significant amount of variation in children's recall however, none of the individual factors accounted for a significant amount of unique variance in children's recall. Rhythmicity-daily habits, flexibility/rigidity, age, and approach/withdrawal accounted for 5.8%, 2.8%, 2.1% and 1.4 % of the variance in children's recall for memory 2, respectively.

Table 3.6

Predisposing Factors in the Prediction of Details Recalled for Memories with Positive Valence and Low Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Age	3.57	2.28	.151	.121	.145	.021
Approach/Withdrawal	2.60	2.03	.124	.202	.120	.014
Flexibility/Rigidity	4.05	2.26	.171	.076	.167	.028
Rhythmicity-Daily Habits	6.81	2.65	.252	.012	.240	.058
Intercept	-112.44	52.42				
	R = .44, R^2 = .19, *F* (4,94) = 5.61, *p* = .001					

Note. N = 99

3.2.3 Memory 3: Negative valence, high arousal. Correlations for memory 3 are presented in Table 3.7. Age (p <.001), mood (p <.001), rhythmicity-daily habits (p = .001), and negative valence (p = .004) were significantly and positively correlated with the total number of details recalled in memory 3; effect sizes were considered medium. The correlations observed suggest that older children, children with a more positive quality of mood, and children with increased regularity recalled more details from negative events with high arousal. Additionally, memories rated as increasingly negative were recalled in more detail. Approach/withdrawal (p = .04) and arousal (p = .04) displayed positive correlations with small effect sizes. Negative valence was positively related to the number of details reported for memories with negative valence and high arousal, approaching a medium effect size magnitude.

Table 3.7

Correlations for Memory 3 (Negative Valence, High Arousal)

	Valence	Negative Valence	Arousal	Total Details Recalled
Age	-.25*	.28*	.22*	.38***
Gender	-.06	-.03	.11	.16
Attachment Security	.03	-.12	-.12	.04
Activity Level General	-.06	.14	-.03	-.09
Activity Level Sleep	-.18	.15	.11	.12
Approach/Withdrawal	.04	-.06	.00	.21*
Flexibility/Rigidity	-.22*	.04	.17	.19
Mood	-.06	-.03	.07	.36***
Rhythmicity-Sleep	.28**	.29**	-.15	.10
Rhythmicity-Eating	.25**	-.02	-.13	.21*
Rhythmicity-Daily Habits	.10	.07	.03	.33**
Task Orientation	.09	-.08	-.06	-.00
Valence		-.56**	-.52**	-.15
Negative Valence			.46***	.28**
Arousal				.21*

Note. $N = 99$

* = $p < .05$

** = $p < .01$

*** = $p < .001$

Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables

Table 3.8 contains the results of the regression analysis for memory 3. The predisposing and precipitating factors accounted for 30% of the variance for memories with negative valence and high arousal. Negative valence and arousal significantly predicted recall over and above the predisposing factors. Age (3.4%) and negative valence (3%) predicted the most unique variance in memory 3, followed by mood (2.7%), rhythmicity-daily habits (1.9%), approach/withdrawal (0.7%), arousal (0.1%) and rhythmicity-eating (0.0%).

Table 3.8

Hierarchical Multiple Regression in the Prediction of Details Recalled for Memories with Negative Valence and High Arousal

	B	*SE*	β	*p*	*sr*	sr^2
Variable Predisposing Factors (Step 1)						
Age	4.51	2.16	.20	.040	.184	.034
Approach/Withdrawal	1.70	1.84	.09	.359	.081	.007
Flexibility/Rigidity	1.16	2.10	.05	.580	.049	.002
Mood	3.03	1.62	.20	.066	.164	.027
Rhythmicity-Eating	.12	2.10	.03	.814	.020	.000
Rhythmicity-Daily Habits	4.18	2.70	.17	.118	.139	.019
Precipitating Factors (Step 2)						
Negative Valence	7.70	3.88	.21	.052	.174	.030
Arousal	1.90	4.95	.04	.703	.034	.001
Intercept	-196.07	.57.62				
	Model 1 R = .51, R^2 = .26, F (6,92) =5.270, p <.001					
	Model 2 R = .55, R^2 = .30, F (8,90) = 4.90, p <.001					
	ΔR^2 .05, F_{Change} (2, 90) = 2.97, p = .056					

Note. N = 99

3.2.4 Memory 4: Negative valence, low arousal. Age (p = .001) and rhythmicity-daily habits (p = .003) were significantly and positively correlated with the total number of details recalled in memory 4. Significant correlations suggest that increases in age and regularity are associated with enhanced recall for negative events with low arousal. Age and memory details demonstrated a medium effect while the correlations for gender (p = .034) and rhythmicity-daily habits approximated a medium effect. Approach/withdrawal (p = .027), and mood (p = .044) demonstrated small effect magnitudes. Correlations for memory 4 are presented in Table 3.9.

Table 3.9

Memory 4 (Negative Valence, Low Arousal) Correlations

	Valence	Negative Valence	Arousal	Total Details
Age[a]	.25*	-.20*	.13	.32**
Gender[a]	-.07	-.10	.19	.21*
Attachment Security	.16	-.11	-.10	.05
Activity Level General	-17	.08	-.20*	-.13
Activity Level Sleep	-.04	.05	-.11	.08
Approach/Withdrawal	-.00	.03	.02	.22*
Flexibility/Rigidity	.02	-.07	.02	.20*
Mood	.01	-.07	-.06	.26*
Rhythmicity-Sleep	.14	-.07	-.10	.10
Rhythmicity-Eating	.10	-.12	.01	.15
Rhythmicity-Daily Habits	-.06	.08	-.06	.29**
Task Orientation	.06	-.13	.07	.01
Valence		-.53***	.31*	.03
Negative Valence			-.23*	.10
Arousal				.12

Note. $N = 99$

* = $p < .05$

** = $p < .01$

*** = $p < .001$

Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables

Table 3.10 contains the results of the regression analysis for memory 4. The predisposing factors entered into the model accounted for 21% of the variance for memories with negative valence and low arousal. Age predicted the most (4%) unique variance in memory 4, followed by rhythmicity-daily habits (2.5%), approach/withdrawal (1.8%), gender (1.4%), flexibility/rigidity (1.0%), and mood (0.1%).

Table 3.10

Predisposing Factors in the Prediction of Details Recalled for Memories with Negative Valence and Low Arousal

Variable	*b*	*SE*	β	*p*	*sr*	sr^2
Age	6.45	3.05	.21	.04	.196	.038
Gender	26.41	20.75	.13	.21	.118	.014
Approach/Withdrawal	3.93	2.70	.15	.15	.135	.018
Flexibility/Rigidity	3.25	3.02	.11	.28	.100	.010
Mood	.76	2.32	.04	.74	.03	.001
Rhythmicity-Daily Habits	6.10	3.56	.18	.09	.159	.025
Intercept	-.222.62	72.49				
		R = .458, R^2 = .21, *F* (6,92) = 4.06, *p* =001				

Note. N = 99

3.3 Research Question 3

3) To examine whether the type of interview (CNET, NET) administered to children would result in significant differences in the number of details recalled, four t-tests were run on the number of details recalled; one t-test was run for each memory.

Descriptive statistics for the CNET and the NET are presented in Table 3.11.

Table 3.11

Descriptive Statistics for Interview Techniques

	NET M (SD) *n* = 51	CNET M (SD) *n* = 48
Memory 1 (positive, high)	122.67 (98.23)	132.67 (100.11)
Memory 2 (positive, low)	111.90 (79.35)	124.06 (79.62)
Memory 3 (negative, high)	105.55 (71.12)	116.71 (77.78)
Memory 4 (negative, low)	105.86 (94.28)	112.35 (111.29)

The total number of details reported by participants using the CNET was not significantly different than the number of details reported by participants using the NET for memories rated as positive with high arousal, *t* (97) = -.502, *p* = .617, positive with low arousal, *t* (97) = -.761, *p* = .449, negative with high arousal, *t* (97) = -.746, *p* = .458, and negative with low arousal, *t* (97) = -.314, *p* = .754.

3.4 Research Question 4

To examine how predisposing (age, gender, attachment, temperament), precipitating (emotional valence, emotional arousal), and perpetuating (recall perspective, interview type) factors account for the unique and shared variance in recall of details in each of the six memory components: (a) contextual/ temporal, (b) sensory/somatosensory, (c) procedural, (d) behavioral, (e) cognitive, and (f) affective/emotional, as well as which variables account for the most variance, and how these factors interact, a series of preliminary correlational analyses were conducted to determine where significant relationships between the factors and the number of details in each memory component exist. Following correlational analyses, significant factors were entered into a regression analysis to determine which variables are significant predictors and the relative importance of the predictors. Interactions were assessed by creating mean centered (i.e., variables were converted to deviation scores) interaction variables to avoid problems that arise (i.e., multicollinearity) when the interaction product is correlated with the component independent variables (Tabachnick & Fidell, 2013).

3.4.1 Memory 1 (positive valence, high arousal) components. Perpetuating factors were added to the analyses for question 4 to address specific hypotheses regarding relationships between the perpetuating factors and children's recall for different memory components. The degree of field perspective reported by the children for memory 1 had a mean of 5.61 (S*D*= 2.86). Fifty-one of the 99 children included in this analysis were assigned to use the NET while 48 utilized the CNET. Fifty-two participants were asked to use the observer perspective and 47 were asked to use the field perspective.

Correlation coefficients for contextual details reported from memory 1 are presented in Table 3.12. Approach/Withdrawal (p = .001) was positively related to the number of contextual details reported by children in memory 1 with a medium effect size. Attachment security (p = .025), flexibility/rigidity (p = .041), and rhythmicity-daily habits (p = .011) were positively correlated with contextual details (p < .05), indicating that children with increasingly secure attachment and participants with more regularity and flexibility recalled more contextual details in memory 1. Effect size magnitudes were small.

Table 3.12

Memory 1 Contextual Details Correlations

	Field Perspective	Elaboration Technique	Contextual Details
Age	-.09	-.05	.10
Gender	-.14	-.14	.02
Attachment Security	.09	.05	.23*
Activity Level General	-.08	-.10	.04
Activity Level Sleep	.08	.04	-.04
Approach/Withdrawal	.06	.16	.33**
Flexibility/Rigidity	.03	.06	.21*
Mood	-.06	-.01	.19
Rhythmicity-Sleep	-.19	-.05	.15
Rhythmicity-Eating	-.25*	-.05	.18
Rhythmicity-Daily Habits	-.04	.03	.25*
Task Orientation	.07	-.06	.19
Valence	.08	.21*	.14
Positive Valence	-.22*	-.05	.16
Arousal	.17	.11	.10
Field Perspective		-.41***	-.03
Elaboration Technique			.00

Note. N = 99
* = p < .05
** = p <.01
*** = p <.001
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.
Phi coefficients were used to measure the relationship between two dichotomous variables.
Both the point-biserial and phi coefficients are similar to the Pearson correlation coefficient in their interpretation.

Table 3.13 contains the results of the regression analysis for contextual details reported by participants in memory 1. The predisposing factors entered into the model accounted for 18% of the variance in contextual details reported for memories with positive valence and high arousal. Approach/withdrawal predicted a significant amount of (5.5%) the unique variance, while flexibility/rigidity (2.1%), rhythmicity- daily habits (2.1%), and attachment security (0.0%) did not.

Table 3.13

Predisposing Factors and the Prediction of Contextual Details Reported for Memories Rated as Positive Valence, High Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Attachment Security	1.43	1.15	.12	.216	.116	.000
Approach/Withdrawal	5.81	2.30	.25	.013	.235	.055
Flexibility/Rigidity	4.00	2.56	.15	.121	.146	.021
Rhythmicity-Daily Habits	4.70	3.04	.15	.126	.144	.021
Intercept	-172.44	69.04				
	R = .42, R^2 = .18, *F* (4,95) = 5.09, *p* = .001					

Note. $N = 99$

Correlation coefficients for procedural details reported from memory 1 are presented in Table 3.14. Flexibility/rigidity was positively related (p = .002) to the number of procedural details reported by children in memory 1 with a medium effect size. Rhythmicity-sleep (p = .017), rhythmicity-eating (p = .013), and rhythmicity-daily habits were positively correlated (p = .011) with procedural details and small effect sizes were demonstrated. Children with more behavioural flexibility and rhythmicity in their biological functioning, sleeping, and eating recalled more procedural details in memory 1.

Table 3.14

Memory 1 Procedural Details Correlations

	Procedural Details
Age	.08
Gender	.07
Attachment Security	.15
Activity Level General	-.10
Activity Level Sleep	-.00
Approach/Withdrawal	.16
Flexibility/Rigidity	.31**
Mood	.12
Rhythmicity-Sleep	.26*
Rhythmicity-Eating	.24*
Rhythmicity-Daily Habits	.25*
Task Orientation	.19
Valence	.09
Positive Valence	.11
Arousal	.03
Field Perspective	-.11
Elaboration Technique	.03

Note. N = 99
* = $p < .05$
** = $p < .01$
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Regression coefficients are presented in Table 3.15. The temperament dimensions in the regression model for procedural details reported from memories with positive valence and high arousal accounted for a significant amount of variation in children's recall. Flexibility/Rigidity accounted for a significant proportion (9.4%) of the unique variance. The other temperament dimensions did not account for a significant amount of the unique variance in children's recall. Rhythmicity-sleep, rhythmicity-eating and rhythmicity-daily habits accounted for 2.6%, 1.7%, and 0.6 % of the variance in children's recall for procedural details in memory 1, respectively.

Table 3.15

Predisposing Factors and the Prediction of Procedural Details Reported for Memories Rated as Positive Valence, High Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Flexibility/Rigidity	5.49	1.64	.31	.001	.308	.094
Rhythmicity-Sleep	1.69	.97	.18	.086	.160	.026
Rhythmicity-Eating	1.47	1.76	.09	.406	.077	.006
Rhythmicity-Daily Habits	3.09	2.17	.15	.157	.131	.017
Intercept	-120.37	33.94				
	R = .45, R^2 = .20, F (4,94) = 5.91, p <.001					

Note. N = 99

Correlation coefficients for behavioural details in memory 1 are presented in Table 3.16. Approach/withdrawal was positively related (p = .003) to the number of behavioural details reported by children in memory 1 with a medium effect size. Attachment security (p = .049) and rhythmicity-daily habits (p = .040) were positively correlated with behavioural details with small effect size magnitudes.

Table 3.16

Memory 1 Behavioural Detail Correlations

	Behavioural Details
Age	.03
Gender	.05
Attachment Security	.20*
Activity Level General	-.01
Activity Level Sleep	-.09
Approach/Withdrawal	.30**
Flexibility/Rigidity	.18
Mood	.16
Rhythmicity-Sleep	.13
Rhythmicity-Eating	.14
Rhythmicity-Daily Habits	.21*
Task Orientation	.17
Valence	.15
Positive Valence	.14
Arousal	.06
Field Perspective	-.02
Elaboration Technique	.03

Note. N = 99
* = $p < .05$
** = $p < .01$
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.17 contains the results of the regression analysis for behavioural details reported by participants in memory 1. The predisposing factors in the model accounted for 11% of the variance in behavioural details reported for memories with positive valence and high arousal. Approach/withdrawal predicted a significant proportion (6.9%) of the unique variance. Attachment security accounted for 2.1% of the unique variance in behavioural details reported by participants in memory 1.

Table 3.17

Predisposing Factors and the Prediction of Behavioural Details Reported for Memories Rated as Positive Valence, High Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Attachment Security	1.26	.83	.15	.131	.146	0.021
Approach/Withdrawal	4.55	1.66	.27	.007	.263	0.069
Intercept	-72.51	46.27				
	R = .33, R^2 = .11, F (2,97) = 5.885, p = .004					

Note. N = 99

Correlation coefficients for cognitive details in memory 1 are presented in Table 3.18. Age (p = .001), flexibility/rigidity (p = .002), and rhythmicity-daily habits (p = .010) were positively related to the number of cognitive details reported by children in memory 1 and medium effect sizes were demonstrated. Approach/withdrawal (p = .017) and mood (p = .046) were positively correlated with the recall of cognitive details with small effect size magnitudes.

Table 3.18

Memory 1 Cognitive Details Correlations

	Cognitive Details
Age	.34**
Gender	.06
Attachment Security	.06
Activity Level General	-.01
Activity Level Sleep	.10
Approach/Withdrawal	.24*
Flexibility/Rigidity	.31**
Mood	.20*
Rhythmicity-Sleep	.02
Rhythmicity-Eating	.12
Rhythmicity-Daily Habits	.26**
Task Orientation	.01
Valence	.13
Positive Valence	.15
Arousal	.12
Field Perspective	-.13
Elaboration Technique	.16

Note. N = 99
* = $p < .05$
** = $p < .01$
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.19 contains the results of the regression analysis for the cognitive details reported by participants in memory 1. The predisposing factors in the model accounted for 24% of the variance in cognitive details reported for memories with positive valence and high arousal. Age (6.1%) and flexibility/rigidity (5.7%) predicted a significant proportion of the unique variance in cognitive details. Rhythmicity-daily habits, approach/withdrawal, and mood accounted for 2.5%, 2.1%, and 0.2 of the unique variance, respectively.

Table 3.19

Predisposing Factors and the Prediction of Cognitive Details Reported for Memories Rated as Positive Valence, High Arousal

Variable	*b*	*SE*	β	*p*	*sr*	sr^2
Age	1.54	.56	.26	.007	.247	.061
Approach/Withdrawal	.80	.50	.15	.110	.146	.021
Flexibility/Rigidity	1.51	.57	.26	.009	.240	.057
Mood	-.25	.44	-.06	.571	-.051	.002
Rhythmicity-Daily Habits	1.17	.67	.17	.083	.16	.025
Intercept	-48.23	13.05				
	R = .49 R^2 = .24, F (5,94) = 5.84, p <.001					

Note. N = 99

Correlation coefficients for sensory details are presented in Table 3.20. Elaboration technique was positively related to the number of sensory details reported (p = .001) with a medium effect size. Activity level sleep (p = .048), valence (p = .024), and degree of field perspective (p = .021) shared a positive correlation with sensory details and small effect sizes were indicated. Children who used the CNET, endorsed higher sleep activity levels, and children who rated their memories as increasingly positive and their recall with a higher degree of field perspective recalled more sensory details in memory 1.

Table 3.20

Memory 1 Sensory Details Correlations

	Sensory Details
Age	-.01
Gender	-.06
Attachment Security	.03
Activity Level General	-.08
Activity Level Sleep	.20*
Approach/Withdrawal	.12
Flexibility/Rigidity	.03
Mood	-.07
Rhythmicity-Sleep	-.06
Rhythmicity-Eating	-.18
Rhythmicity-Daily Habits	.03
Task Orientation	-.06
Valence	.23*
Positive Valence	.02
Arousal	.13
Field Perspective	.23*
Elaboration Technique	.32**

Note. N = 99

* = $p < .05$

Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.21 contains the results of the regression analysis for the sensory details reported by participants in memory 1. The predisposing, precipitating, and perpetuating factors in the model accounted for 17% of the variance in sensory details reported for memories with positive valence and high arousal. Elaboration technique (4.9%) predicted a significant proportion of the unique variance in sensory details. Activity level sleep, valence, and field perspective accounted for 2.9%, 1.5%, and 0.9% of the unique variance, respectively.

Table 3.21

Predisposing, Precipitating, and Perpetuating Factors and the Prediction of Sensory Details Reported for Memories Rated as Positive Valence, High Arousal

Variable	*b*	*SE*	β	*p*	*sr*	sr^2
Activity Level Sleep	.37	.20	.17	.073	.170	.029
Valence	.98	.74	.13	.188	.124	.015
Field Perspective	.29	.28	.10	.315	.095	.009
Elaboration Technique	3.90	1.63	.25	.02	.222	.049
Intercept	-15.03	6.62				
	R = .41, R^2 = .17, F (4,94) = 4.12, p = .001					

Note. N = 99

Correlation coefficients for affective details are presented in Table 3.22. None of the observed relationships were statistically significant. No regression analysis was conducted.

Table 3.22

Memory 1 Affective Details Correlations

	Affective Details
Age	-.10
Gender	.10
Attachment Security	.04
Activity Level General	.06
Activity Level Sleep	.01
Approach/Withdrawal	.07
Flexibility/Rigidity	.11
Mood	-.03
Rhythmicity-Sleep	-.01
Rhythmicity-Eating	.04
Rhythmicity-Daily Habits	.02
Task Orientation	.09
Valence	-.08
Positive Valence	.12
Arousal	.12
Field Perspective	-.09
Elaboration Technique	.09

Note. $N = 99$

[a] Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

3.4.2 Memory 2 (positive valence, low arousal) components. Correlation coefficients for contextual details are presented in Table 3.23. Rhythmicity-daily habits was positively correlated (p = .006) with contextual details and the effect size approached a medium magnitude. Approach/withdrawal was also positively correlated (p = .021) with contextual details and a small effect size was indicated. The mean degree of field perspective reported by children for Memory 2 was 5.5 (*SD* =3.26). Fifty-two children were asked to use the observer perspective for Memory 2 and 47 were asked to use the field perspective.

Table 3.23

Memory 2 Contextual Details Correlations

	Field Perspective	Contextual Details
Age	.01	.18
Gender	-.04	.12
Attachment Security	.08	.13
Activity Level General	.01	.02
Activity Level Sleep	.06	.02
Approach/Withdrawal	-.02	.23*
Flexibility/Rigidity	.03	.14
Mood	-.07	.12
Rhythmicity-Sleep	.06	.06
Rhythmicity-Eating	.02	.12
Rhythmicity-Daily Habits	.03	.28**
Task Orientation	.00	.02
Valence	.02	.14
Positive Valence	.15	.11
Arousal	.06	.07
Field Perspective		-.08
Elaboration Technique		-.02

Note. N = 99
* = $p < .05$
** = $p < .01$
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.24 contains the results of the regression analysis for behavioural details reported by participants for memory 2. The temperament dimensions in the model accounted for 11% of the variance in contextual details reported for memories with positive valence and high arousal. Rhythmicity-daily habits predicted a significant proportion (5.2%) of the unique variance. Approach/Withdrawal accounted for 2.9% of the unique variance in contextual details reported by participants for memory 2.

Table 3.24

Temperament Dimensions and the Prediction of Contextual Details Reported for Memories Rated as Positive Valence, High Arousal.

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Approach/Withdrawal	4.61	2.63	.17	.08	.169	0.029
Rhythmicity-Daily Habits	7.92	3.40	.23	.02	.227	0.052
Intercept	-73.67	55.84				
	R = .32, R^2 = .11, *F* (2,96) = 5.62, *p* = .005					

Note. N = 99

Correlation coefficients for procedural details are presented in Table 3.25. Flexibility/rigidity was positively related (*p* = .002) to the number of procedural details reported with a medium effect size. Rhythmicity-daily habits shared a positive correlation (*p* = .014) with the number of procedural details reported by children with a small effect size.

Table 3.25

Memory 2 Procedural Details Correlations

	Procedural Details
Age	.19
Gender	.11
Attachment Security	.11
Activity Level General	-.14
Activity Level Sleep	.02
Approach/Withdrawal	.10
Flexibility/Rigidity	.31**
Mood	.04
Rhythmicity-Sleep	.16
Rhythmicity-Eating	.15
Rhythmicity-Daily Habits	.25*
Task Orientation	.05
Valence	-.06
Positive Valence	.04
Arousal	.05
Field Perspective	.11
Elaboration Technique	-.06

Note. N = 99
* = $p < .05$
** = $p < .01$
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.26 contains the results of the regression analysis for the procedural details reported by participants for memory 2. The temperament dimensions in the model accounted for 15% of the variance in procedural details reported for memories with positive valence and low arousal. Flexibility/rigidity and rhythmicity-daily habits accounted for a significant proportion (8.8% and 5.3%, respectively) of the unique variance in procedural details.

Table 3.26

Temperament Dimensions and the Prediction of Procedural Details Reported for Memories Rated as Positive, Low Arousal

Variable	*b*	*SE*	β	*p*	*sr*	sr^2
Flexibility/Rigidity	3.77	1.20	.30	.002	.296	0.088
Rhythmicity-Daily Habits	3.36	1.37	.23	.016	.231	0.053
Intercept	-61.92	23.20				
	R = .39, R^2 = .15, F (2,96) = 8.37, p < .001					

Note. N = 99

Correlation coefficients for behavioural details are presented in Table 3.27. Approach/withdrawal was positively related (p = .040) to behavioural details reported by participants for memory 2. A small effect size was demonstrated.

Table 3.27

Memory 2 Behavioural Details Correlations

	Behavioural Details
Age	.15
Gender	.09
Attachment Security	.12
Activity Level General	.10
Activity Level Sleep	.03
Approach/Withdrawal	.21*
Flexibility/Rigidity	.16
Mood	.09
Rhythmicity-Sleep	-.01
Rhythmicity-Eating	.08
Rhythmicity-Daily Habits	.18
Task Orientation	.00
Valence	.16
Positive Valence	.15
Arousal	.03
Field Perspective	-.06
Elaboration Technique	-.08

Note. N = 99
* = $p < .05$
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.28 contains the results of the regression analysis for behavioural details reported by participants for memory 2. The model predicted 4% of the variance in the number of behavioural details reported for memories rated as positive valence, low arousal.

Table 3.28

Approach/Withdrawal and the Prediction of Behavioural Details Reported for Memories Rated as Positive Valence, Low Arousal.

Variable	*b*	*SE*	β	*p*	*sr*	sr^2
Approach/Withdrawal	4.38	2.10	.21	.04	.21	0.044
Intercept	-15.41	39.67				
	R = .21, R^2 = .04, F (1,97) = 4.33, p = .04					

Note. N = 99

Age ($p < .001$) and mood ($p = .006$) were positively related to the number of cognitive details reported by children for memory 2. Effect sizes were broadly in the average range. Flexibility/rigidity ($p = .025$) and rhythmicity-daily habits ($p = .025$) were positively correlated with cognitive details. Small effect sizes were indicated. Correlation coefficients for cognitive details reported for memory 2 are presented in Table 3.29.

Table 3.29

Memory 2 Cognitive Details Correlations

	Cognitive Details
Age	.37***
Gender	.19
Attachment Security	.04
Activity Level General	-.06
Activity Level Sleep	.04
Approach/Withdrawal	.12
Flexibility/Rigidity	.22*
Mood	.27**
Rhythmicity-Sleep	.08
Rhythmicity-Eating	.11
Rhythmicity-Daily Habits	.22*
Task Orientation	-.07
Valence	-.10
Positive Valence	-.01
Arousal	-.04
Field Perspective	-.13
Elaboration Technique	.15

Note. $N = 99$
* = $p < .05$
** = $p < .01$
*** = $p < .001$
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.30 contains the results of the regression analysis for the cognitive details reported by participants for memory 2. The overall model accounted for 19% of the variance in cognitive details reported for memories with positive valence and high arousal. Age predicted a significant proportion (7.4%) of the unique variance in cognitive details. Flexibility/rigidity, rhythmicity-daily habits, and mood accounted for 1.6%, 1.3%, and 0.8% of the unique variance, respectively.

Table 3.30

Predisposing Factors and the Prediction of Details Cognitive Details Reported in Memories Rated as Positive Valence, Low Arousal.

Variable	*b*	*SE*	β	*p*	*sr*	sr^2
Age	1.85	.63	.29	.004	.272	0.074
Flexibility/Rigidity	.86	.63	.13	.176	.126	0.016
Mood	.47	.78	.10	.331	.09	0.008
Rhythmicity-Daily Habits	.91	.73	.12	.217	.115	0.013
Intercept	41.08	13.20				
	R = .44, R^2 = .19, F (4,95) = 5.62, p <.001					

Note. N=99

Correlation coefficients for sensory details are presented in Table 3.31. Elaboration technique was positively related ($p < .001$) to sensory details reported. This effect size was moderate to large in magnitude. Activity level sleep shared a positive correlation ($p = .033$) with sensory details with a small effect size demonstrated. Children who utilized the CNET for recall and reported higher sleep activity levels reported more sensory details for memory 2.

Table 3.31

Memory 2 Sensory Details Correlations

	Sensory Details
Age	-.06
Gender	.06
Attachment Security	.09
Activity Level General	-.08
Activity Level Sleep	.21*
Approach/Withdrawal	.07
Flexibility/Rigidity	.05
Mood	.06
Rhythmicity-Sleep	-.09
Rhythmicity-Eating	-.15
Rhythmicity-Daily Habits	.04
Task Orientation	-.06
Valence	-.05
Positive Valence	.05
Arousal	-.00
Field Perspective	.00
Elaboration Technique[a]	.44***

Note. $N = 99$
* = $p < .05$
*** = $p < .001$
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.32 contains the results of the regression analysis of sensory details reported by participants for memory 2. The regression model accounted for 30% of the variance in sensory details reported for memories with positive valence and low arousal. Elaboration technique and activity level sleep accounted for 18.7% and 4% of the unique variance, respectively. Both factors were significant predictors.

Table 3.32

Predisposing and Perpetuating Factors and the Prediction of Details Sensory Details Reported for Memories Rated as Positive Valence, Low Arousal.

Variable	*b*	*SE*	β	*p*	*sr*	sr^2
Activity Level Sleep	.37	.17	.20	.028	.199	.040
Elaboration Technique	5.94	1.22	.43	.000	.432	.187
Intercept	-7.23	2.65				
	R = .55, R^2 = .30, *F* (3,96) = 13.561, *p* <.001					

Note. N = 99

Correlation coefficients for affective details are presented in Table 3.33. Age (*p* = .001) and mood (*p* = .015) shared positive correlations with affective details. Effect sizes were medium to large in magnitude.

Table 3.33

Memory 2 Affective Details Correlations

	Affective Details
Age	.34**
Gender	.12
Attachment Security	-.07
Activity Level General	-.06
Activity Level Sleep	.12
Approach/Withdrawal	.12
Flexibility/Rigidity	.13
Mood	.24*
Rhythmicity-Sleep	-.06
Rhythmicity-Eating	-.10
Rhythmicity-Daily Habits	.07
Task Orientation	-.14
Valence	-.00
Positive Valence	.07
Arousal	.01
Field Perspective	-.01
Elaboration Technique	-.01

Note. N = 99
* = *p* < .05
** = *p* <.01
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Results of the regression analysis for affective details reported by participants for memory 2 are presented in Table 3.34. The model accounted for 14% of the variance in affective details reported for memories with positive valence and low arousal. Age predicted a significant proportion (7.8%) of the unique variance. Mood accounted for 2.3 % of the unique variance in affective details.

Table 3.34

Predisposing Factors and the Prediction of Affective Details Reported for Memories Rated as Positive Valence, Low Arousal

Variable	*b*	*SE*	*β*	*p*	*sr*	sr^2
Age	.74	.25	.30	.003	.28	0.078
Mood	.27	.17	.15	.122	.15	0.023
Intercept	-6.01	4.39				
	R = .37, R^2 = .14, F (2,97) = 7.785, p <.001					

Note N = 99

3.4.3 Memory 3 (negative valence, high arousal) components. Children's mean field perspective rating for Memory 3 was 5.27 (*SD* = 2.95). Forty-seven children were requested to use the observer perspective and 52 were requested to use the field perspective. Correlation coefficients for contextual details reported in negative memories with high arousal are presented in Table 3.35. Rhythmicity-daily habits (p = .002), age (p = .006), and mood (p = .010) were significantly and positively correlated with contextual details. Approach/withdrawal (p = .027), rhythmicity-eating (p = .047), negative valence (p = .027), and degree of field perspective (p = .017) were positively correlated with contextual details. Older children, children with higher approach scores, children with increasingly positive emotionality, children with increased biological regularity, and children with increased rhythmicity in eating habits recalled more contextual details for memories rated as negative with high arousal. Higher ratings of negative affect during the event, and increases in first-person perspective during recall were also associated with increases in contextual details recalled from the event. Effect sizes were small to moderate in magnitude.

Table 3.35

Memory 3 Contextual Details Correlations

	Field Perspective	Contextual Details
Age	.15	.27**
Gender	.22*	.09
Attachment Security	.06	-.02
Activity Level General	.04	-.09
Activity Level Sleep	-.09	.12
Approach/Withdrawal	.09	.22*
Flexibility/Rigidity	.05	.04
Mood	.13	.26**
Rhythmicity-Sleep	.17	.08
Rhythmicity-Eating	.20	.20*
Rhythmicity-Daily Habits	.17	.31**
Task Orientation	.06	.07
Valence	.02	-.15
Negative Valence	.11	.24*
Arousal	.19	.16
Field Perspective		.24*
Elaboration Technique		.01

Note. $N = 99$

* = $p < .05$

** = $p < .01$

Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.36 contains the results of the regression analysis for contextual details reported by participants for memory 3. The regression model accounted for 22% of the variance in contextual details reported for memories with negative valence and high arousal. Negative valence predicted the most (3.1%) unique variance, followed by rhythmicity-daily habits (2.1%), field perspective (1.8%), approach/withdrawal (1.6%), age 1.2%), mood (0.9%), and rhythmicity-eating (0.0%).

Table 3.36

Predisposing, Precipitating and Perpetuating Factors in the Prediction of Contextual Details Reported for Memories Rated with Negative Valence and High Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Age	3.09	2.63	.12	.242	.108	0.012
Approach/Withdrawal	3.03	2.23	.13	.177	.125	0.016
Mood	1.94	1.92	.11	.314	.093	0.009
Rhythmicity-Eating	.27	2.55	.01	.915	.010	0.000
Rhythmicity-Daily Habits	5.10	3.25	.17	.120	.144	0.021
Negative Valence	8.14	4.26	.19	.059	.176	0.031
Field Perspective	4.11	2.80	.14	.146	.135	0.018
Intercept	-187.73	62.75				
	R = .47, R^2 = .22, *F* (7,92) = 3.75, *p* = .001					

Note. $N = 99$

Table 3.37 contains the correlation coefficients for procedural details reported by participants for memory 3. Flexibility/rigidity ($p < .001$) and rhythmicity-daily habits ($p = .002$) were positively related to the number of procedural details reported by children for memory 3, demonstrating medium effect sizes. Age ($p = .019$), rhythmicity-sleep ($p = .024$), and rhythmicity-eating ($p = .046$) were positively correlated with procedural details with small effect sizes demonstrated.

Table 3.37

Memory 3 Procedural Details Correlations

	Procedural Details
Age	.24*
Gender	.11
Attachment Security	.03
Activity Level General	-.16
Activity Level Sleep	.03
Approach/Withdrawal	.15
Flexibility/Rigidity	.36***
Mood	.16
Rhythmicity-Sleep	.23*
Rhythmicity-Eating	.20*
Rhythmicity-Daily Habits	.31**
Task Orientation	.08
Valence	-.04
Negative Valence	.14
Arousal	.11
Field Perspective	.14
Elaboration Technique	.09

Note. $N = 99$
* = $p < .05$
** = $p < .01$
*** = $p < .001$
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.38 contains the results of the regression analysis for procedural details reported by participants for memory 3. The regression model for procedural details reported from memories with negative valence and high arousal accounted for a significant amount of variation (26%) in children's recall of procedural details. Flexibility/rigidity accounted for a significant proportion (10.8 %) of the unique variance. The other temperament dimensions did not account for a significant amount of the unique variance in children's recall. Rhythmicity-daily habits, rhythmicity-sleep, age, and rhythmicity-eating accounted for 3.5%, 2.4%, 1.3 %, and 0% of the variance in children's recall for procedural details for memory 3, respectively.

Table 3.38

Predisposing Factors and the Prediction of Procedural Details Reported for Memories Rated as Negative Valence, High Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Age	1.74	1.35	.12	.200	.115	0.013
Flexibility/Rigidity	4.88	1.33	.34	.000	.329	0.108
Rhythmicity-Sleep	1.35	.78	.17	.087	.155	0.024
Rhythmicity-Eating	-.01	1.41	.00	.997	.000	0.000
Rhythmicity-Daily Habits	3.63	1.74	.22	.040	.186	0.035
Intercept	-117.44	28.67				
	R = .51, R^2 = .26, F (5, 93) = 6.35, p < .001					

Note N = 99

Correlation coefficients for behavioural details are presented in Table 3.39. Rhythmicity-daily habits (p = .008) and age (p = .010) were significantly and positively related to the number of behavioural details reported by children for memory 3 with small to moderate effect size magnitudes. Approach/withdrawal (p = .048), mood (p = .017), negative valence (p = .014), and field perspective (p = .020) were positively correlated with behavioural details and obtained small effect sizes.

Table 3.39

Memory 3 Behavioural Details Correlations

	Behavioural Details
Age	.26**
Gender	.07
Attachment Security	-.05
Activity Level General	-.10
Activity Level Sleep	.11
Approach/Withdrawal	.20*
Flexibility/Rigidity	.06
Mood	.24*
Rhythmicity-Sleep	.08
Rhythmicity-Eating	.19
Rhythmicity-Daily Habits	.27**
Task Orientation	-.01
Valence	-.15
Negative Valence	.25*
Arousal	.17
Field Perspective	.23*
Elaboration Technique	-.00

Note. N = 99

* = $p < .05$

** = $p < .01$

Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.40 contains the results of the regression analysis for behavioural details reported by participants for memory 3. The regression model accounted for 32% of the variance in behavioural details reported for memories with negative valence and high arousal. Negative valence accounted for 3.5 % of the unique variance in behavioural details. The degree of field perspective used by participants, rhythmicity-daily habits, approach/withdrawal, age, and mood accounted for 1.9%, 1.5%, 1.3 %, 1.3%, and 1% of the unique variance, respectively.

Table 3.40

Predisposing, Precipitating, and Perpetuating Factors and the Prediction of Behavioural Details Reported for Memories Rated as Negative Valence, High Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Age	2.07	1.92	.11	.284	.100	0.010
Approach/Withdrawal	2.02	1.62	.12	.217	.115	0.013
Mood	1.46	1.39	.11	.296	.098	0.010
Rhythmicity-Daily Habits	2.93	2.19	.14	.184	.124	0.015
Negative Valence	6.27	3.11	.20	.047	.187	0.035
Field Perspective	3.06	2.04	.14	.137	.139	0.019
Intercept	-128.35	45.60				
	R = .57, R^2 = .32, F (5,93) = 6.228, p <.001					

Note N = 99

Correlation coefficients are displayed in Table 3.41. Age ($p < .001$) was positively related to the number of cognitive details reported by children for memory 3 with an effect size approaching a large magnitude. Rhythmicity-daily habits ($p = .018$), mood ($p = .034$), and gender ($p = .043$) were positively related to the number of cognitive details reported by children for memory 3 with small effect sizes demonstrated. Female children, children who endorsed more regularity, and children with a more positive quality of mood recalled more cognitive details from events rated as negative and highly arousing.

Table 3.41

Memory 3 Cognitive Details Correlations

	Cognitive Details
Age	.40***
Gender	.20*
Attachment Security	-.13
Activity Level General	-.02
Activity Level Sleep	.15
Approach/Withdrawal	.12
Flexibility/Rigidity	.19
Mood	.21*
Rhythmicity-Sleep	.02
Rhythmicity-Eating	.06
Rhythmicity-Daily Habits	.24*
Task Orientation	-.10
Valence	-.09
Negative Valence	.18
Arousal	.13
Field Perspective	.14
Elaboration Technique	.08

Note. $N = 99$
* = $p < .05$
*** = $p < .001$
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.42 contains the results of the regression analysis for the cognitive details reported by participants for memory 3. The predictive model accounted for 20% of the variance in cognitive details reported for memories with negative valence and high arousal. Age predicted a significant proportion (9.9%) of the unique variance in cognitive details. Rhythmicity-daily habits, gender, and mood accounted for 1.6%, 0.7%, and 0.2 of the unique variance, respectively.

Table 3.42

Predisposing Factors and the Prediction of Cognitive Details Reported for Memories Rated as Negative Valence, High Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Age	2.09	.64	.34	.001	.315	0.099
Gender	3.74	4.06	.09	.360	.085	0.007
Mood	.21	.44	.05	.635	.044	0.002
Rhythmicity-Daily Habits	.98	.80	.14	.166	.128	0.016
Intercept	-31.23	11.96				
	R = .45, R^2 = .20, F (4,95) = 5.849, p <.001					

Note. N = 99

Correlation coefficients for sensory details are presented in Table 3.43. Elaboration technique (p = .014), attachment security (p = .016), and activity level sleep (p = .041) shared positive correlations with sensory details reported by children for memory 3. Small effect sizes were demonstrated.

Table 3.43

Memory 3 Sensory Details Correlations

	Sensory Details
Age	-.10
Gender	-.11
Attachment Security	.24*
Activity Level General	-.19
Activity Level Sleep	.21*
Approach/Withdrawal	.17
Flexibility/Rigidity	.12
Mood	.13
Rhythmicity-Sleep	-.09
Rhythmicity-Eating	-.07
Rhythmicity-Daily Habits	.09
Task Orientation	-.11
Valence	-.01
Negative Valence	.02
Arousal	.00
Field Perspective	-.01
Elaboration Technique	.25*

Note. N = 99
* = p < .05

Table 3.44 contains the results of the regression analysis for the sensory details reported by participants for memory 3. The regression model for sensory details accounted for 19% of the variance in sensory details reported for memories with negative valence and high arousal. Attachment security (8.8%) and activity level sleep (7.5%) accounted for a significant amount of the unique variance in sensory details recalled. Elaboration technique accounted for 4.8% of the unique variance in sensory details recalled for memory 3.

Table 3.44

Predisposing and Perpetuating Factors and the Prediction of Sensory Details Reported for Memories Rated as Negative Valence, High Arousal

Variable	*b*	*SE*	β	*p*	*sr*	sr^2
Attachment Security	.33	.10	.31	.002	.297	.088
Activity Level Sleep	.63	.21	.29	.004	.273	.075
Elaboration technique	3.59	1.50	.22	.019	.220	.048
Intercept	-12.08	5.42				
	R = .43, R^2 = .19, *F* (3, 96) = 7.36, *p*<.001					

Note. $N = 99$

Correlation coefficients for affective details are presented in Table 3.45. None of the observed relationships were statistically significant; thus, no regression analysis was conducted.

Table 3.45

Memory 3 Affective Details Correlations

	Affective Details
Age	.13
Gender	.11
Attachment Security	-.02
Activity Level General	.12
Activity Level Sleep	.13
Approach/Withdrawal	-.02
Flexibility/Rigidity	.16
Mood	.07
Rhythmicity-Sleep	.02
Rhythmicity-Eating	.08
Rhythmicity-Daily Habits	.19
Task Orientation	-.07
Valence	-.07
Negative Valence	-.08
Arousal	-.08
Field Perspective	.13
Elaboration Technique	-.06

Note. $N = 99$
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

3.4.4 Memory 4 (negative valence, low arousal) components. Correlation coefficients for contextual details reported from memories with negative valence and low arousal are presented in Table 3.46. Approach/withdrawal was significantly and positively correlated ($p = .010$) with contextual details for memory 4. Age ($p = .025$), mood ($p = .039$), and rhythmicity-daily habits ($p = .016$) were positively correlated with contextual details. Effect sizes ranged from small to moderate in magnitude. Children's mean field perspective rating for Memory 3 was 5.66 ($SD = 2.90$). Forty-eight children were asked to use the observer perspective and 51 used the field perspective.

Table 3.46

Memory 4 Contextual Details

	Field Perspective	Elaboration Technique	Contextual Details
Age	-.02	.05	.22*
Gender	.01	.14	.13
Attachment Security	.01	-.05	.07
Activity Level General	-.07	.10	-.13
Activity Level Sleep	.13	-.04	.05
Approach/Withdrawal	.03	-.16	.26**
Flexibility/Rigidity	-.16	-.06	.16
Mood	.02	.01	.21*
Rhythmicity-Sleep	-.07	.05	.10
Rhythmicity-Eating	-.01	.05	.12
Rhythmicity-Daily Habits	-.00	-.03	.24*
Task Orientation	.04	.06	.10
Valence	.14	.07	.07
Negative Valence	-.04	-.02	.15
Arousal	.07	-.13	.12
Field Perspective		-.03	.05
Elaboration Technique			-.03

Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.47 contains the results of the regression analysis for contextual details reported by participants for memory 4. The predisposing factors in the model accounted for 13% of the variance in contextual details reported for memories with negative valence and low arousal. Approach/withdrawal, age, rhythmicity-daily habits, and mood accounted for 3.3%, 2.4%, 1.7%, and .02%, respectively of the unique variance in contextual details reported by participants for memory 4.

Table 3.47

Predisposing Factors and the Prediction of Contextual Details Reported for Memories Rated as Negative Valence, Low Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Age	4.84	2.98	.16	.107	.155	0.024
Approach/Withdrawal	5.01	2.63	.19	.060	.182	0.033
Mood	1.15	2.24	.06	.608	.049	0.002
Rhythmicity-Daily Habits	4.78	3.54	.14	.182	.129	0.017
Intercept	-140.04	64.87				
	R = .36, R^2 = .13, F (3,96) = 4.74, p = .004					

Note. N = 99

Correlation coefficients for procedural details are presented in Table 3.48. Flexibility/rigidity (p = .008), rhythmicity-sleep (p = .030), rhythmicity-daily habits (p = .013), and valence (p = .043) shared positive correlations with procedural details. Activity level general (p = .048) shared a negative relationship with procedural details recalled by participants for memory 4. Children with increased behavioural flexibility, children with increased regularity in biological functions and sleeping habits, and children who reported lower general activity levels recalled more procedural details from memory 4. Memories rated as increasingly positive were associated with increased recall of procedural details. Effect size magnitudes ranged from small to medium.

Table 3.48

Memory 4 Procedural Details Correlations

	Procedural Details
Age	.12
Gender	.13
Attachment Security	.09
Activity Level General	-.20*
Activity Level Sleep	.02
Approach/Withdrawal	.12
Flexibility/Rigidity	.27**
Mood	.16
Rhythmicity-Sleep	.22*
Rhythmicity-Eating	.19
Rhythmicity-Daily Habits	.25*
Task Orientation	.09
Valence	.20*
Negative Valence	.01
Arousal	.10
Field Perspective	-.04
Elaboration Technique	.08

Note. N = 99
* = $p < .05$
** = $p < .001$
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.49 contains the results of the regression analysis for the procedural details reported by participants for memory 4. The temperament dimensions in the model accounted for 19% of the variance in procedural details reported for memories with negative valence and low arousal. Flexibility/rigidity accounted for 5.9% of the unique variance in procedural details. Valence, rhythmicity-daily habits, rhythmicity-sleep, and activity level general accounted for 3%, 2.8%, 1.8% and 0.8% of the unique variance in procedural details, respectively.

Table 3.49

Predisposing and Precipitating Factors and the Prediction of Procedural Details Reported for Memories Rated as Negative Valence, Low Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Activity Level General	-1.32	1.35	-.09	.334	-.090	.008
Flexibility/Rigidity	4.79	1.84	.25	.011	.242	.059
Rhythmicity-Sleep	1.54	1.05	.15	.148	.136	.018
Rhythmicity-Daily Habits	4.15	2.22	.19	.065	.174	.030
Valence	7.73	4.32	.17	.077	.166	.028
Intercept	-97.81	51.039				
	R = .44, R^2 = .19, *F* (5,93) = 4.511, *p* = .001					

Note. N = 99

Correlation coefficients for behavioural details are presented in Table 3.50. Mood (p = .007), age (p = .027), approach/withdrawal (p = .036), flexibility/rigidity (p = .030), and rhythmicity-daily habits (p = .022) were positively related to behavioural details reported by participants for memory 4 with effect sizes demonstrated in small to moderate magnitudes.

Table 3.50

Memory 4 Behavioural Details

	Behavioural Details
Age	.22*
Gender	.16
Attachment Security	.11
Activity Level General	-.13
Activity Level Sleep	.08
Approach/Withdrawal	.21*
Flexibility/Rigidity	.22*
Mood	.27**
Rhythmicity-Sleep	.09
Rhythmicity-Eating	.11
Rhythmicity-Daily Habits	.23*
Task Orientation	.02
Valence	.08
Negative Valence	.08
Arousal	.14
Field Perspective	.03
Elaboration Technique	.03

Note. N = 99

* = $p < .05$

** = $p < .01$

Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.51 contains the results of the regression analysis for behavioural details reported by participants for memory 4. The model predicted 14% of the variance in the number of behavioural details reported for memories rated with negative valence, low arousal. Flexibility/rigidity, age, rhythmicity-daily habits, approach/withdrawal, and mood accounted for 1.7%, 1.5%, 1.4%, 1.2%, and 0.8 % of variance in behavioural details, respectively.

Table 3.51

Predisposing Factors and the Prediction of Behavioural Details Reported for Memories Rated as Negative Valence, Low Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Age	2.69	2.11	.13	.206	.122	0.015
Approach/Withdrawal	2.17	1.86	.12	.246	.111	0.012
Flexibility/Rigidity	2.92	2.14	.14	.175	.131	0.017
Mood	1.57	1.64	.11	.339	.092	0.008
Rhythmicity-Daily Habits	3.09	2.51	.13	.220	.118	0.014
Intercept	-126.50	49.04				
	R = .38, R^2 = .14, F (5,94) = 3.101, p = .012					

Note. N = 99

Correlation coefficients for cognitive details reported for memory 4 are presented in Table 3.52. Age (p <.001) and rhythmicity-daily habits (p = .001) were positively related to the number of cognitive details reported by children for memory 4 with medium to large effect size magnitudes. Flexibility/Rigidity (p = .016) and mood (p = .030) were positively correlated with cognitive details. Small effect sizes were demonstrated.

Table 3.52

Memory 4 Cognitive Details Correlations

	Cognitive details
Age	.46***
Gender	.19
Attachment Security	.03
Activity Level General	-.12
Activity Level Sleep	-.01
Approach/Withdrawal	.18
Flexibility/Rigidity	.24*
Mood	.22*
Rhythmicity-Sleep	.06
Rhythmicity-Eating	.18
Rhythmicity-Daily Habits	.32**
Task Orientation	-.06
Valence	.12
Negative Valence	.06
Arousal	.17
Field Perspective	-.06
Elaboration Technique	.06

Note. N = 99
* = p < .05
** = p <.01
*** = p <.001
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.53 contains the results of the regression analysis for the cognitive details reported by participants for memory 4. The predisposing factors in the model accounted for 29% of the variance in cognitive details reported for memories with negative valence and low arousal. Age predicted a significant proportion (14%) of the unique variance in cognitive details. Rhythmicity-daily habits, flexibility/rigidity, and mood accounted for 4.9%, 2.5%, and 0.1% of the unique variance respectively.

Table 3.53

Predisposing Factors and the Prediction of Cognitive Details Reported for Memories Rated as Negative Valence, Low Arousal

Variable	*b*	SE	β	*p*	*sr*	sr^2
Age	2.23	.52	.40	.000	.374	0.140
Flexibility/Rigidity	.95	.52	.17	.072	.157	0.025
Mood	-.14	.39	-.04	.724	-.031	0.001
Rhythmicity Daily Habits	1.54	.60	.24	.012	.222	0.049
Intercept	-39.80	10.83				
	R = .54, R^2 = .29, F (5,94) = 7.78, p <.001					

Note. N = 99

Correlation coefficients for sensory details are presented in Table 3.54. Elaboration technique was positively related (p = .001) to sensory details reported for memory 4 with a moderate effect size.

Table 3.54

Memory 4 Sensory Details Correlations

	Sensory Details
Age	-.07
Gender	. 07
Attachment Security	-.04
Activity Level General	-.04
Activity Level Sleep	.03
Approach/Withdrawal	.11
Flexibility/Rigidity	.03
Mood	.05
Rhythmicity-Sleep	-.06
Rhythmicity-Eating	-.08
Rhythmicity-Daily Habits	-.03
Task Orientation	-.04
Valence	-.09
Negative Valence	.09
Arousal	-.03
Field Perspective	-.02
Elaboration Technique	.32**

Note. N = 99

** = p <.01

Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Table 3.55 contains the results of the regression analysis of sensory details reported by participants for memory 4. The model accounted for 10% of the variance in sensory details.

Table 3.55

Elaboration Technique and the Prediction of Sensory Details Reported for Memories Rated as Negative Valence, Low Arousal

Variable	*b*	SE	β	*p*	*sr*	sr^2
Elaboration Technique	5.26	1.57	.32	.001	.320	.102
Intercept	-1.57	2.47				
	R = 32, R^2 = .10, *F* (1,98) = 11.18, *p* = .001					

Note. N = 99

Correlation coefficients for affective details are presented in Table 3.56. Age (*p* = .030), approach/withdrawal (*p* = .047), flexibility/rigidity (*p* = .030), and rhythmicity-daily habits (*p* = .043) were positively related to sensory details reported. Small effect sizes were indicated.

Table 3.56

Memory 4 Affective/Emotional Details

	Affective Details
Age	.22*
Gender	.16
Attachment Security	-.04
Activity Level General	-.13
Activity Level Sleep	.00
Approach/Withdrawal	.20*
Flexibility/Rigidity	.21*
Mood	.16
Rhythmicity-Sleep	.04
Rhythmicity-Eating	.14
Rhythmicity-Daily Habits	.20*
Task Orientation	.09
Valence	-.08
Negative Valence	.09
Arousal	.08
Field Perspective	.16
Elaboration Technique	.02

Note. N = 99

* = $p < .05$

Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Results of the regression analysis for affective details reported by participants for memory 4 are presented in Table 3.57. The predisposing factors in the model accounted for 12% of the variance in affective details reported for memories with negative valence and low arousal. Flexibility/rigidity, age, approach/withdrawal, and rhythmicity daily habits predicted 2.3%, 2.1%, 1.6%, and 1.6% of the unique variance, respectively.

Table 3.57

Predisposing Factors and the Prediction of Affective Details Reported for Memories Rated as Negative Valence, Low Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Age	.55	.36	.15	.134	.146	.021
Approach/Withdrawal	.42	.32	.13	.190	.127	.016
Flexibility/Rigidity	.57	.36	.16	.117	.152	.023
Rhythmicity Daily Habits	.54	.42	.13	.199	.125	.016
Intercept	-17.66	8.31				
	R = .34, R^2 = .12, *F* (4,95) = 3.19, *p* = .017					

Note. $N = 99$

3.5 Research Question 5

The manner in which predisposing (age, gender, attachment, temperament), precipitating (emotional valence, emotional arousal), and perpetuating (recall perspective, interview type) factors account for unique and shared variance in recall of central and peripheral details, as well as which variables account for the most variance, and how these factors interact were examined with preliminary correlational analyses and significant relationships were followed up with regression or multiple regression analyses.

Correlation coefficients for central and peripheral details observed for memory 1 are presented in Table 3.58. Flexibility/rigidity was positively correlated (p = .045) with central details. Approach/withdrawal was positively correlated (p = .013) with peripheral details. Task orientation was positively correlated (p = .025) with peripheral details. Effect sizes were small to medium in magnitude.

Table 3.58

Correlations Central and Peripheral Details Reported for Memories with Positive Valence and High Arousal

	Central Details	Peripheral Details
Age	.12	-.06
Gender	.09	-.09
Attachment Security	.03	.12
Activity Level General	-.08	-.06
Activity Level Sleep	.00	-.03
Approach/Withdrawal	.19	.25*
Flexibility/Rigidity	.20*	.07
Mood	.11	.10
Rhythmicity-Sleep	.13	.11
Rhythmicity-Eating	.16	.14
Rhythmicity-Daily Habits	.17	.14
Task Orientation	.19	.22*
Valence	.04	.06
PositiveValence	.08	.13
Arousal	.01	.13
Field Perspective	-.13	-.02
Elaboration Technique	.09	-.12
Central Details		.33**

Note. N = 99
* = p <.05
** = p <.01
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Results of the regression analyses for central and peripheral details reported by participants for memory 1 are presented in Table 3.59 and Table 3.60. The first model accounted for 4% of variance in central details reported for memory 1. Flexibility/rigidity accounted for 4% of the unique variance in central details. The second model accounted for 9% of variance in peripheral details reported for memory 1. Approach/withdrawal accounted for 4.4% of the unique variance and task orientation accounted for 3.2% of the unique variance in peripheral details.

Table 3.59

Flexibility/Rigidity in Predicting Central Details for Memories with Positive Valence and High Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Flexibility/Rigidity	.56	.28	.20	.045	.201	.040
Intercept	9.38	4.03				
	R = .20, R^2 = .04 *F* (1,98) = 4.131, *p* = .045					

Note. $N = 99$

Table 3.60

Temperament Dimensions and Predicting Peripheral Details Memories with Positive Valence and High Arousal

Variable	*b*	*SE*	β	*p*	*sr*	sr^2
Approach/Withdrawal	16.15	7.46	21	.033	.209	.044
Task Orientation	11.51	6.18	.18	.066	.180	.032
Intercept	-391.31	169.005				
	R = .31, R^2 = .09, *F* (2,97) = 5.041, *p* = .008					

Note. $N = 99$

Correlation coefficients for central and peripheral details observed for memories with positive valence and low arousal are presented in Table 3.61. Approach/withdrawal was positively correlated ($p = .009$) with central details reported by participants for memory 2, with an effect size approaching moderate in magnitude. Rhythmicity-daily habits was positively related ($p < .001$) to peripheral details and a moderate effect size was demonstrated. Age ($p = .013$) and flexibility/rigidity ($p = .030$) were positively correlated with peripheral details reported for memory 2 with small effect sizes indicated.

Table 3.61

Correlations Central and Peripheral Details Reported for Memories with Positive Valence and Low Arousal

	Central Details	Peripheral Details
Age	.08	.25*
Gender	.3	.20
Attachment Security	.04	.14
Activity Level General	.10	-.05
Activity Level Sleep	-.11	.05
Approach/Withdrawal	.26**	.19
Flexibility/Rigidity	.14	.22*
Mood	.11	.15
Rhythmicity-Sleep	-.06	.09
Rhythmicity-Eating	-.10	.15
Rhythmicity-Daily Habits	-.09	.36***
Task Orientation	-.12	.01
Valence	-.04	.04
Positive Valence	-.02	.04
Arousal	.15	.07
Field Perspective	-.12	-.04
Elaboration Technique	.02	.08
Central Details		.30***

Note. $N = 99$
* = $p < .05$
** = $p < .01$
*** = $p < .001$
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Results of the regression analyses for central and peripheral details reported by participants for memory 2 are presented in Table 3.62 and Table 3.63. The first model accounted for 7% of the variance in central details reported for memory 2. Approach/withdrawal predicted 6.8% of the unique variance in central details and was a unique predictor. The second model accounted for 19% of the variance in peripheral details reported for memory 2. Rhythmicity-daily habits predicted a significant proportion (9.8%) of the unique variance in peripheral details. Flexibility/rigidity accounted for 3% and age accounted for 2.1% of the unique variance in peripheral details.

Table 3.62

Approach/Withdrawal in Predicting Central Details for Memories with Positive Valence and Low Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Approach/Withdrawal	.95	.360	.26	.009	.261	.068
Intercept	.61	6.74				
	R = .26, R^2 = .07, *F* (1,97) = 7.107, *p* = .009					

Note. $N = 99$

Table 3.63

Predisposing Factors in Predicting Peripheral Details for Memories with Positive Valence and Low Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Age	3.35	2.13	.15	.119	.145	.021
Flexibility/Rigidity	3.89	2.09	.17	.066	.172	.030
Rhythmicity-Daily Habits	8.16	2.40	.32	.001	.313	.098
Intercept	-93.15	42.74				
	R = .44, R^2 = .19, *F* (3,95) = 7.843, *p* <.001					

Note. $N = 99$

Correlation coefficients for central and peripheral details observed for memories with negative valence and high arousal are presented in Table 3.64. Age was significantly and positively correlated with peripheral (p = .001) and central details (p = .007). Small to moderate effect sizes were indicated. Rhythmicity-daily habits was positively related to peripheral (p = .005) details with an effect size approaching a medium magnitude. Approach/withdrawal (p = .026), mood (p = .022), rhythmicity-daily habits (p = .011), negative valence (p = .031), and arousal (p = .028), were also positively related to central details, with small effect sizes demonstrated. Mood (p = .003), negative valence (p = .007), and field perspective (p = .019) were positively correlated with peripheral details with effect sizes in small to moderate magnitudes.

Table 3.64

Correlations of Central and Peripheral Details Reported for Memories with Negative Valence and High Arousal

	Central Details	Peripheral Details
Age	.27**	.33***
Gender	.16	.12
Attachment Security	-.07	.04
Activity Level General	-.14	-.10
Activity Level Sleep	.10	.13
Approach/Withdrawal	.22*	.18
Flexibility/Rigidity	.10	.09
Mood	.23*	.29***
Rhythmicity-Sleep	.06	.07
Rhythmicity-Eating	.18	.18
Rhythmicity-Daily Habits	.26*	.28**
Task Orientation	.03	.02
Valence	-.17	-.13
Negative Valence	.22*	.27**
Arousal	.22*	.19
Field Perspective	.18	.24*
Elaboration Technique	-.02	.05
Central Details		.76***

Note. N = 99
* = $p < .05$
** = $p < .01$
*** = $p < .001$
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Results of the regression analyses for central and peripheral details reported by participants for memory 3 are presented in Table 3.65 and Table 3.66. The first model accounted for 18% of variance in central details reported for memory 3, although none of the predisposing or precipitating factors entered into the model predicted a significant amount of unique variance in central details. Approach/withdrawal, rhythmicity-daily habits, age, arousal, negative valence, and mood predicted 2.1%, 1.8%, 1.5%, 1.2%, 1.0%, and 0.6% of the unique variance in central details respectively. The second model accounted for 24% of variance in peripheral details reported for memory 3. Negative valence, age, mood, rhythmicity-daily habits, and field perspective predicted 3.5%, 2.5%, 2.5%, 1.8% and 1.8% of the unique variance in peripheral details, respectively.

Table 3.65

Predisposing and Precipitating Factors in Predicting Central Details for Memories with Negative Valence and High Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Age	.53	.40	.14	.193	.123	.015
Approach/Withdrawal	.53	.34	.16	.124	.146	.021
Mood	.25	.29	.09	.400	.080	.006
Rhythmicity-Daily Habits	.64	.46	.15	.162	.133	.018
Negative Valence	.77	.73	.12	.290	.100	.010
Arousal	1.04	.90	.13	.253	.108	.012
Intercept	-24.58	10.25				
	R = .43, R^2 = .18, *F* (6,92) = 3.426 *p* = .004					

Note. N = 99

Table 3.66

Predisposing, Precipitating, and Perpetuating Factors in Predicting Peripheral Details for Memories with Negative Valence and High Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Age	4.49	2.56	.18	.082	.159	.025
Mood	3.13	1.80	.18	.086	.157	.025
Rhythmicity-Daily Habits	4.30	2.87	.15	.137	.136	.018
Negative Valence	8.51	4.11	.20	.041	.187	.035
Field Perspective	4.0	2.70	.14	.146	.133	.018
Intercept	-172.92	53.72				
	R = .49, R^2 = .24, *F* (5,93) = 7.085, *p* <.001					

Note. N = 99

Correlation coefficients for central and peripheral details observed for memories with negative valence and low arousal are presented in Table 3.67. Age was positively correlated with central details (p = .001) and peripheral details (p = .003) and moderate effect sizes were demonstrated. Mood was positively related to central (p = .003) and peripheral (p = .013) details with effect sizes approaching medium magnitudes. Gender (p = .038) and rhythmicity-eating (p = .037) were positively correlated with central details and both obtained small effect sizes. Approach/withdrawal (p = .029), flexibility/rigidity (p = .034) and rhythmicity daily habits (p = .005) were positively related to peripheral details reported for memory 4 with effect sizes in small to moderate ranges.

Table 3.67

Correlations for Central and Peripheral Details Reported for Memories with Negative Valence and Low Arousal

	Central Details	Peripheral Details
Age	.34**	.29**
Gender	.21*	.20
Attachment Security	.02	.05
Activity Level General	-.10	-.12
Activity Level Sleep	.03	.09
Approach/Withdrawal	.10	.22**
Flexibility/Rigidity	.11	.21*
Mood	.27**	.25**
Rhythmicity-Sleep	.08	.11
Rhythmicity-Eating	.21*	.14
Rhythmicity-Daily Habits	.19	.28*
Task Orientation	.06	-.01
Valence	.03	.02
Negative Valence	.02	.12
Arousal	.19	.11
Field Perspective	-.04	-.01
Elaboration Technique	.02	.04
Central Details		.55***

Note. N = 99
* = p < .05
** = p <.01
*** = p <.001
Point-biserial correlations were examined to assess the strength and direction of the relationships between dichotomous and continuous variables.

Results of the regression analyses for central and peripheral details reported by participants for memory 4 are presented in Table 3.68 and Table 3.69. The first model accounted for 18% of variance in central details reported for memory 1, although none of the predisposing factors entered into the model predicted a significant amount of unique variance in central details. Age, mood, gender, and rhythmicity- eating predicted 5.5%, 1.4%, 1.5%, and 1.5% of the unique variance in central details, respectively. The second model accounted for 18% of variance in peripheral details reported for memory 4. Age, rhythmicity-daily habits, flexibility/rigidity, approach/withdrawal, and mood predicted 3.7%, 2.7%, 1.6%, 1.3% and 0.3% of the unique variance in peripheral details, respectively.

Table 3.68

Predisposing Factors in Predicting Central Details for Memories with Negative Valence and Low Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Age	.93	.38	.25	.014	.234	.055
Gender	3.13	2.51	.12	.216	.117	.014
Mood	.35	.27	.14	.195	.122	.015
Rhythmicity- Eating	.44	.34	.13	.198	.121	.015
Intercept	-11.01	7.41				
	R = .42, R^2 = .18, F (4,94) = 4.978, p = .001					

Note. N = 99

Table 3.69

Predisposing and Precipitating Factors in Predicting Peripheral Details for Memories with Negative Valence and Low Arousal

Variable	*B*	*SE*	β	*p*	*sr*	sr^2
Age	5.78	2.82	.21	.043	.193	.037
Approach/Withdrawal	3.03	2.50	.12	.223	.115	.013
Flexibility/Rigidity	3.81	2.83	.14	.181	.127	.016
Mood	.98	2.17	.05	.653	.042	.002
Rhythmicity-Daily Habits	5.84	3.33	.18	.082	.165	.027
Intercept	-184.48	65.12				
	R = .42, R^2 = .18, F (5,943) = 4.025, p = .002					

Note. N = 99

A valence x arousal interaction variable was created and mean centered to test the hypothesis that increases in recall of central details due to negative valence would be greater for

memories characterized by increased arousal, however main effects and interaction results of these analyses were not statistically significant ($p > .05$).

3.6 Research Question 6

4) To determine whether attachment and temperament were related, Pearson product-moment correlation coefficients were examined to assess the strength and direction of the relationships between the variables. Descriptive statistics are presented in Table 3.70.

Table 3.70

Attachment and Temperament Means and Standard Deviations

Dimension	*M(SD)*
Attachment	49 (7.7)
Temperament	
Activity Level General	18.9 (4.7)
Activity Level Sleep	11.4 (3.7)
Approach/Withdrawal	18.6 (3.8)
Flexibility/Rigidity	14.2 (3.3)
Mood	23.8 (4.8)
Rhythmicity-Sleep	15.3 (3.7)
Rhythmicity-Eating	13.5 (2.9)
Rhythmicity-Daily Habits	11.9 (4.6)
Task Orientation	20 (4.6)

Note. $N = 100$

Correlation coefficients are presented in Table 3.71. Attachment security was positively related to activity level sleep (p = .004), mood (p = .006), rhythmicity-eating (p = .006), rhythmicity-daily habits (p = .011), and task orientation (p = .041). Small to moderate effect size magnitudes were demonstrated. These significant relationships indicate that children rated as more security attached demonstrated more activity while resting, endorse a more positive quality of mood, have more regularity in their natural, biological functions and eating, and demonstrate increased persistence and lower distractibility when carrying out a task.

Table 3.71

Attachment and Temperament Dimension Correlations

	ALG	ALS	A/W	F/R	M	RS	RE	RD	T/O
Attachment	-.134	-.285 **	.183	.130	.272**	.072	.271**	.254*	.205*
Temperament									
Activity Level General		.073	.014	-.157	-.137	-.054	-.245*	-.135	-.352**
Activity Level Sleep			-.110	-.147	.117	-.089	-.067	-.053	-.239
Approach/Withdrawal				.134	.280**	.067	.242*	.252*	.193
Flexibility/Rigidity					.3110**	-.058	.043	.052	.111
Mood						.078	.319**	.347**	.060
Rhythmicity-Sleep							.77**	.306**	.276**
Rhythmicity-Eating								.477**	.389**
Rhythmicity-Daily Habits									.184

Note. N = 100
* = p < .05
** = p <.01

ALG = Activity Level General, AS = Activity Level Sleep, A/W = Approach/Withdrawal, F/R = Flexibility/Rigidity, M = Mood, RS = Rhythmicity-Sleep, RE = Rhythmicity-Eating, RD = Rhythmicity-Daily Habits, TO = Task Orientation

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3.7 Research Question 7

Four t-tests were run to determine whether securely attached children recalled positive experiences significantly better than negative experiences and whether insecurely attached children demonstrated the opposite pattern. Two t-tests were run for securely attached children and two for insecurely attached children. In these analyses, the emotional event condition (i.e., positive valence with high arousal was compared with negative valence with high arousal; positive valence with low arousal was compared with negative valence with low arousal) is the independent variable and the number of details recalled is the dependent variable. Cohen's *d* effect sizes were used to quantify the magnitude of statistically significant effects where values of $d = .20$ are considered small, $d = .50$ are considered moderate, and $d = .80$ are considered large (Cohen, 1992). Descriptive statistics are presented in Table 3.72.

Table 3.72

Descriptive Statistics for Securely Attached and Insecurely Attached Children

Memory	Details Recalled by Securely Attached Children *M(SD)* (*N* =75)	Details Recalled by Insecurely Attached Children *M(SD)* (*N* = 24)
Positive, High Arousal	139.85(103.31)	88.96(42.07)
Positive, Low Arousal	127.47(82.83)	87.58(58.83)
Negative, High Arousal	113.31(73.93)	103.63(73.36)
Negative Low Arousal	111.41(111.94)	101.50 (65.44))

Children rated as securely attached recalled their positive experiences with low arousal in significantly more detail than their negative memories, $t(74) = 2.70$, $p = .009$ with a small effect size demonstrated ($d = .32$). Memories for experiences with high arousal produced no significant differences among the number of details reported, $t(74) = 1.76$, $p = .08$. No significant differences were found in insecurely attached children's positive and negative recall with high, $t(23) = -.1.11$, $p = .28$, or low, $t(23) = -1.68$, $p = .11$, arousal.

3.8 Research Question 8

To determine whether the emotional valence and arousal of the memory, the age of the memory, and the age and gender of the child could be used to predict the degree of field recall perspective naturally used by the child, relationships were examined with preliminary correlational analyses and only significant relationships were followed up with regression or multiple regression analyses. Descriptive statistics are observed in Table 3.73.

Table 3.20

Memory Age Descriptive Statistics

Memory	Memory Age *M(SD)*
Positive Valence, High Arousal	659.29 (976.16)
Positive Valence, Low Arousal	471.68 (733.59)
Negative Valence, High Arousal	750.58 (969.55)
Negative Valence, Low Arousal	586.29 (820.30)

Note. $N = 99$

Correlation coefficients are presented in Table 3.74. For the negative valence, low arousal memory, the age of the memory was negatively and positively related ($p = .035$) to the degree of field recall perspective naturally used by the child. That is, newer memories were associated with increases in the degree of field recall perspective. A small effect size was indicated.

Table 3.21

Degree of Field Perspective Naturally Used Correlations

	Child's Age	Memory Age	Gender	Arousal	Valence	Positive Valence	Negative Valence
FP1	-.02	.15	-.05	-.04	.11	-.06	
FP2	.00	-.06	.00	.18	.13	.15	
FP3	.09	-.14	.00	-.03	-.01		.04
FP4	.06	-.21*	-.06	.10	-.03		.17

Note. $N = 99$

FP = Degree of Field Perspective

When entered into a regression equation, the age of memory, in memories rated as negative valence, low arousal, significantly predicted the amount of field recall naturally used by children where newer memories resulted in a significantly greater degree of field recall than

older memories, $R = .21$, F (1,97) = 4.60, $p = .04$. The mean centered valence x arousal interaction variable did not significantly predict recall perspective ratings ($p > .05$).

3.9 Research Question 9

To determine whether field and observer recall differs in terms of the degree of anxiety experienced during recall, a t-test was used where the independent variable was recall perspective and the dependent variable was the degree of anxiety reported. Descriptive statistics are presented in Table 3.75.

Table 3.22

Degree of Anxiety Reported Descriptive Statistics

Memory	Degree of Anxiety (Field) *M (SD)*	Degree of Anxiety (Observer)
Positive Valence, High Arousal	2.20 (2.52)	2.49 (2.61)
Positive Valence, Low Arousal	2.26 (2.39)	2.43 (2.33)
Negative Valence, High Arousal	4.76 (2.80)	4.61 (2.98)
Negative Valence, Low Arousal	3.58 (2.99)	4.19 (2.94)

Note. N =100

Children who reported a higher degree of field perspective for memory 1 did not report experiencing more anxiety, t (97) = -.528, $p = .599$. The amount of anxiety experienced by children using the field recall perspective was not significantly different from the amount of anxiety experienced by children using the observer recall perspective for memories rated as positive with low arousal, t (98) = -.336, $p = .738$, negative with high arousal t (98) = .246, p = .806, and negative with low arousal, t (96) = - .948, $p = .346$.

Chapter 4. DISCUSSION

The purpose of the current study was to determine the manner in which individual factors that exist before, during, and following an event account for the variance in children's recall of emotional autobiographical events and which factors account for the most variance. Further objectives of this study were to examine how gender, emotion, age of the memory, and age of the child account for variance in the recall perspective children use to retrieve emotional memories as well as whether field and observer recall perspectives differ in terms of the amount of anxiety children experience during recall.

To address the study objectives, 100 child participants were recruited and asked to recall positive and negative event memories. Predisposing (age, gender, attachment, temperament), precipitating (emotional valence, emotional arousal), and perpetuating (recall perspective, interview technique) factors were measured and simultaneously analysed to examine the relationships between the factors and children's recall of emotional events. Additionally, relationships between these important factors and children's recall of memory component (contextual/temporal, procedural, behavioural, cognitive, sensory/somatosensory, affective) details, as well as central and peripheral details were examined. Finally, children rated the recall perspective they naturally use to recall each of their events, and relationships between predisposing and precipitating factors and children's chosen recall perspective were observed.

The following discussion will begin with a description of the findings addressing the first study objective, evaluating relationships between the predisposing, precipitating, and perpetuating factors, and children's recall of overall event details, memory component details, and central and peripheral details. Next, results of analyses addressing relationships between gender, emotion, age of the memory and age of the child and the recall perspective children chose to adopt to recall their memories will be addressed followed by a brief discussion on the null findings regarding the influence of recall perspectives on anxiety. These research questions will be discussed in the context of several hypotheses which were derived from previous literature and possible explanations for the findings will be explored. Next, forensic and clinical applications of the findings are reviewed. This section closes with limitations of the current study and directions for future research and a general conclusion. The findings from this study indicate that predisposing, precipitating, and perpetuating factors account for variance in a unique, though predictable, manner for different types of event details.

4.1 Biopsychosocial Factors and Children's Recall

Following a great deal of research in this area, researchers have identified age (Fivush et al., 1995; Goodman et al., 1997), gender (Fivush, 1993; Salmon et al., 1995), attachment (Alexander, Quas et al., 2002), temperament (Gordon et al., 1993; Merritt et al., 1994), emotional valence (Fivush et al., 2003), emotional arousal (Peterson & Whalen, 2001), and interview techniques (Saywitz & Snyder,1996) as important influences on children's emotional event recall. One variable that has been found to impact adolescent (Hignette & Cartwright-Hatton, 2008) and adult autobiographical memory (McIsaac & Eich, 2002; 2004; Nigro & Neisser, 1993), but has not been examined across development, is recall perspective. How these variables account for shared and unique variance in recall throughout various stages of development was not examined prior to the current study. The current study was designed to examine the manner in which predisposing, precipitating, and perpetuating factors may be used to predict the quantity and quality of details children recall from emotional events, as well as the relative importance of the factors.

4.1.1 Overall Details. This study was created to contribute to the current literature on the complex relationships between predisposing, precipitating, and perpetuating factors and children's memory for emotional events. Previous researchers implicated emotional arousal and emotional valence as important predictors of children's recall of events; however, the importance of these variables was unclear due to inconsistent findings which may be a result of failure to separate valence and arousal when measuring emotion (Brainerd et al., 2008. The inconsistent findings may also be due to failure to account for individual differences that have been shown to impact emotional retrieval including: age (Saywitz & Snyder, 2006), gender (Salmon et al., 1995), attachment (Alexander, Quas et al., 2002) and temperament (Gordon et al., 1993). The current research was designed to address both possible confounds in an effort to determine the manner in which emotion (valence and arousal) accounts for unique variance in children's recall with the variance due to age, gender, attachment, and temperament removed.

The findings from the current study are consistent with literature that supports a relationship between age, temperament, and arousal and enhanced memory for emotional events. We also found that increases in negative valence were associated with an increased number of details recalled from past events, a finding discrepant with Talarico and colleagues' (2004) and D'Argembeau and colleagues' (2003) studies.

Consistent with the hypotheses presented, older children, children with increased behavioural flexibility, approach tendencies, and a more positive quality of mood reported more details in their emotional event narratives. Temperament dimensions of Flexibility/Rigidity, Approach/Withdrawal, and Rhythmicity-Daily Habits were the strongest predictors of children's recall for positive events, while age of the child at recall was the strongest predictor of children's recall across negative events.

Increases in the intensity of negative valence and arousal in negative memories were associated with enhanced event recall while increases in the intensity of positive valence and arousal in positive memories were not related to recall, after controlling for the variance accounted for by precipitating factors. This finding adds to the less abundant field of research supporting enhanced recall associated with negative emotion (Bernstein, 2002; Budson et al., 2006; Goodman, 2006; Howe, 2007) in recall. Further, given that the two components of negative emotion were highly correlated, the results observed indicate that once shared variance in the number of details is removed from the analysis, valence is the component of emotion that best accounts for increases in the amount of details children recall from a negative event.

Inconsistent with presented hypotheses, gender did not account for a significant amount of variance in children's recall; however, significant relationships were observed in the expected directions for memories rated by children as negative with low arousal. Attachment security was not related to children's recall of emotional events for any memory. It is important to note, however, that only 36% of the sample were male and only 24% of the sample rated their attachment as insecure and thus, the decreased variability in the sample and unequal representation of groups may have resulted in an inability to detect an experimental effect, or the findings may represent a true null effect. The CNET also did not influence children to recall more overall memory details than the NET, as predicted; however, children who used the CNET for recall provided more memory component details (see below).

4.1.2 Memory Components. An additional objective in the current study was to evaluate relationships between precipitating, predisposing, and perpetuating factors and children's recall for different memory components (i.e., contextual, procedural, behavioural, cognitive, sensory, affective details) details. Overall, across memory components, age, flexibility/rigidity approach/withdrawal, rhythmicity-daily habits, and mood shared the strongest relationships with the number of details recalled across components. Age was a significant predictor of cognitive

details reported by children. Older children recalled more cognitive details for all memories and they recalled more contextual and behavioural details of the negative memories, and affective details for memories with low arousal. Flexibility or adaptability (Presley & Martin, 1994; Windle & Lerner, 1986), was a significant predictor of procedural details recalled across memories. Increases in flexibility resulted in more procedural details for all memories and increased recall of cognitive details in positive memories and negative memories with low arousal. Increased regularity in children's daily habits was associated with increased contextual, procedural, and cognitive details across all memories discussed and was related to increased reports of behavioural details in negative memories and positive memories with high arousal. Overall, children with a more positive quality of mood recalled more cognitive details across all four memories as well as more contextual and behavioural details from negatively valenced memories. It appears that children who report more positive mood states are more cognizant of their thoughts during memorable events.

The positive association between age and recall of cognitive details across all memories is likely attributable to increased cognitive capacity and awareness with age (Friedberg & McClure, 2002). The relationships between age and increases in the number of contextual and behavioural details in negative memories were unexpected associations, particularly given the absence of a similar finding in positive event memories. One explanation may be that older children have had increased opportunities to discuss their negative events, and have an enhanced understanding of the social expectations inherent in an interview (Cicchetti & Dawson, 2002; Marche & Salmon, 2013). Particularly, increased exposure to television results in increased exposure to television violence and televised criminal interviews (Browne & Hamilton-Giachritsis, 2005), which may have influenced older children to report more information about the setting and actions in their negative memories, as would be expected in criminal interviews. Further, increased access to social media may allow older children to expand upon these memories with their peers amongst a surplus of negative statements and complaints online (Pfeffer, Zorbach, & Carley, 2013). Additionally, the tendency to report more contextual and behavioural details may be a result of these details comprising the majority of details reported by children. Contextual (M = 414.86, SD = 305.68) and behavioural (M = 265.71, SD = 305.68) details were more frequently reported than procedural (M = 140.09, SD = 189.81)), cognitive (M

= 64.03, *SD* = 68.59), sensory (*M* = 22.9, *SD* = 23.63), and affective (*M* = 45.77, *SD* = 49.70) details across all memories.

A number of expected associations were found between temperament dimensions and increases in children's recall of memory components. These findings are indicative of a relationship between individual differences and the manner in which experiences are encoded in memory (Merrit, Ornstsein, & Spicker, 1994). The tendency for children higher on the approach dimension to recall more contextual and behavioural details is understandable given such children demonstrated enhanced autobiographical recall in other studies (Gordon et al., 1993; Merrit et al., 1994; Switzer, 2006). The association between regularity and children's memory for contextual, procedural, and cognitive details across all memories strongly supports Angleitner and Ostendorf's (1994) hypothesis that other temperament measures are failing to account for an important temperament dimension, particularly for memory. Rhythmicity in children's biological functions is associated with increases in the number and range of details children report from autobiographical memories.

This study provided new information on the types of details that children who are more outgoing and flexible recall from their autobiographical memories. Surprisingly, children who rated themselves as more flexible or adaptable in their routines reported more information about procedures and the order of events. This finding suggests that the children who recall the specific sequences of events are the children less bothered by variance in routine, a finding that appears counterintuitive. It is possible that the children characterized by increased rigidity avoid these details in recall in an effort to avoid distress. It is also possible that these particular memories were not considered to be a part of their regular routine, and thus, the children more driven by routines did not make note of these details in the same manner as they might recall sequences of their regular schedules.

The tendency for children with more positive mood states to demonstrate enhanced recall for cognitive details and behavioural details of negative memories, in the current study, was unexpected. However, upon examination of previous findings (Gordon et al., 1993), one may infer that observed relationships between mood and enhanced recall are a result of emotional expression or the level of intensity with which children express their emotions, as Thomas and Chess (1977) speculated, rather than the type of mood expressed. It is possible that the finding in Gordon and colleagues (1993) study, the tendency for children who express more intense

negative emotions to recall more details, may have been attributable to children's degree of emotionality rather than the tendency toward a negative quality of mood. Future studies may be designed to examine relationships between children's tendencies to express general positive and negative moods and autobiographical recall.

It was anticipated that memories characterized by higher ratings of positive valence would be associated with increased recall of contextual and sensory details while increases in negative valence would be associated with increased recall of cognitive and affective details, similar to D'Argembeau and colleague's (2003) study with adults. In the current study, memories characterized by higher ratings of negative valence were associated with increased recall of contextual/temporal and behavioural details. These differences between the two studies may be due to a number of factors. First, children have access to a narrower range of affect laden memories than adults (Berk, 2013) and the nature of the memories that adults chose may have resulted in the specific differences presented by D'Argembeau and colleagues (2003). For example, 22% of participants in their study described the end of a romantic relationship as their negative events and 18% described a romantic episode for their positive event. The majority of individuals do not report participating in romantic relationships until late adolescence (Bouchey & Furman, 2003; Collins, 2003), and current evidence suggests a trend towards becoming romantically involved even later (Shulman & Connoly, 2013). As such, these experiences reflect a type of interpersonal relationship not experienced by many of the children in the current study. Future studies may be designed to examine the manner in which different aspects of the setting, type of interpersonal relationship (e.g., friend, family, romantic), and other specific predisposing factors may contribute to differences in children's memory component recall.

For memories characterized by negative valence and high arousal, children recalled more contextual and behavioural details when recalling from the field perspective than when using the observer perspective. For memories characterized by positive valence and high arousal, children recalled more sensory/somatosensory details in the field perspective. These findings are inconsistent with research conducted with adults (McIsaac & Eich 2002; 2004; Nigro & Neisser, 1983; Robinson & Swanson, 1993) in which researchers found field memories were characterized by increased affect and cognitions, and observer memories were characterized by more contextual and behavioural details (McIsaac & Eich, 2002; 2004). No significant relationships between recall perspective and the type of details recalled were found for memories

rated as positive or negative with low arousal. These finding suggest a clear advantage of utilizing the field perspective for recall in childhood.

Significant relationships were found between the amount of field perspective used by children and the number of contextual and behavioural details recalled in negatively valenced memories with high arousal as well as the amount of field perspective used and the number of sensory details recalled in positively valanced high arousal memories. Additionally, significant relationships between the ratings of negative valence and the number of contextual and behavioural details recalled were discovered. Consequently, one may be tempted to assume an interaction between the amount of field perspective recalled and the valence ratings of the memory, however the interactions between these variables did not account for a significant amount of variance in component details. Moreover, negative valence was not related to the degree of field perspective reported. Thus, the tendency for increased recall of contextual and behavioural details in negative memories with high arousal and sensory details in positive memories using the field perspective was not related to the intensity of the valence.

One likely explanation of the field recall advantage for recalling memory components in this study is that memories are more frequently recalled using the field perspective (D'Argembeau et al., 2003). Fifty-three percent of children in the current study reported the field perspective as the perspective they naturally use to recall their memories with high arousal. Therefore, using the same perspective for recall may have allowed children to focus more on recalling components of the memory rather than allocating additional cognitive energy to maintaining an artificial recall perspective, particularly for memories characterized by high arousal. Difficulties maintaining an unnatural perspective would likely be more pronounced in children than adults who have enhanced perspective taking skills (Blakemore & Choudhury, 2006).

The second perpetuating factor examined in this study, the CNET was associated with increased reports of cognitive and sensory/somatosensory details for memories with negative valence and low arousal. The CNET was also a significant predictor of enhanced memory for sensory details across all memories in this study. While researchers have demonstrated the NET as promising in multiple studies (Bowen & Howie, 2002; Brown & Pipe, 2003a; Brown & Pipe, 2003b; Camparo et al., 2001; Dorado & Saywitz, 2001; Roebers & Beuscher, 2004; Saywitz & Snyder, 1996), the modifications implemented to create the CNET have resulted in a significant

improvement of memory for cognitive and sensory details. This is an important finding as sensory information, particularly olfactory information (Chu & Downes, 2002), provides a powerful link to autobiographical memories and is significantly more resistant to memory decay (Willander & Larsson, 2006). Thus, obtaining increased access to sensory information utilizing visual cues, which offer a less suggestible technique, makes the CNET a promising method for accessing valuable autobiographical memories.

Interestingly, another predictor of sensory details recalled by children is higher sleep activity level. Increased activity level during sleep was a predictor of enhanced recall in positive memories and was related to increased recall of sensory details in negative memories with high arousal. This relationship may be reflective of a tendency toward further processing of sensory information while asleep (Hennevin, Huetz, & Edeline, 2007). However, as the nature of the analysis was correlational and not causal, it is unclear whether increased activity levels in children results in improved memory for sensory details or enhanced memory for sensory details contributes to higher sleep activity levels. It is also possible that relationships are the result of a third, unmeasured variable.

4.1.3 Central and Peripheral details. A unique contribution of this study was the examination of the manner in which predisposing, precipitating, and perpetuating factors account for shared and unique variance in the central and peripheral details recalled and the relative importance of the variables. Many of the findings were replications of findings for total memory details and will not be reviewed again here, particularly for peripheral details as they comprised the majority of details recalled in each memory (M = 396.22, SD = 294.39) compared to central details (M = 74.84, SD = 34.89). One interesting finding was that children higher in approach tendencies recalled more central details for memories with positive valence and low arousal as well as negative valence and high arousal, and approach tendency was the strongest predictor of central details recalled in those memories. Approach/withdrawal was also the strongest predictor of peripheral details for memories with positive valence and high arousal. Increases in age were associated with increased recall of central and peripheral details in negative memories and peripheral details in positive memories with low arousal. Age was a significant predictor and the strongest predictor of central and peripheral details in memories with negative valence and low arousal. Age and the Approach temperament dimension are therefore the most important

variables, examined in this study, to consider when predicting children's ability to recall central and peripheral details.

Another interesting and unexpected finding was the association between gender and central details recalled for memories with negative valence and low arousal which provides information on the quality of information in recall that may be impacted by gender differences. Female children recalled more central details for these memories than male children. There was no significant relationship present between gender and peripheral details indicating that this increase in central details likely lead to the increase in total details recalled by female participants in memories with negative valence and low arousal. As stated above, a number of possible explanations for these gender differences exist, including a female advantage in verbal memory (Andreano & Cahill, 2009; Pfieke & Fink, 2005) and early parent-child dialogue (Zaman & Fivush, 2013); however, the design of the current study does not permit us to know specifically why this occurs.

Based on previous research (Bernsten, 2002; Talarico et al., 2009), it was anticipated that increases in central details associated with negative valence would be greater for memories characterized by high arousal. In the present study, negative valence and increased arousal ratings were associated with an increase in central details solely for memories with negative valence and high arousal; however, no significant statistical interaction was found. Regardless, we found further support for tunnel memories (Bernsten, 2002; Safer et al., 1998).

Increases in field perspective and negative valence associated with enhanced recall of peripheral details for memories with negative valence and high arousal were interesting and unexpected. The association between increases in negative valence and enhanced memory for peripheral details indicates that increases in both central and peripheral details contributed to increases in total memory details recalled by children in memories with negative valence and high arousal. Increases in peripheral details associated with increases in field perspective were not anticipated for this study but fit with other results in this study. Peripheral details were likely comprised of critical contextual and behavioural components, elements also associated with increases in field recall ratings. Consequently, while results regarding the relationship between the recall perspectives used by children and the type of details recalled were unexpected, this study provided valuable information regarding the relationships between children's recall

perspective and the quality of memory details recalled for memories with negative valence and high arousal.

4.1.4 Attachment and Temperament. Significant relationships between attachment security and temperament dimensions were anticipated and found in the current study. Children rated with higher attachment security demonstrated less activity during sleep, endorsed more positive quality of mood, reported more regularity in their biological functioning, including sleeping patterns, and demonstrated increased persistence and lower distractibility in their daily tasks. This study built upon previous research (Braungart & Stifter, 1991; Hane & Fox, 2006; Switzer, 2006) by increasing the number of temperament dimensions measured across a broader age range and found results similar to those found by Switzer (2006). Therefore, support is provided for these relationships between temperament dimensions and attachment security across parent report measures and self-report measures of attachment. Additionally, like Switzer, when we examined the relative predictive ability of the temperament dimensions and attachment security, we found no support for a unique contribution of attachment to the predictive model, indicating that when shared variance between temperament dimensions and attachment was accounted for, only the temperament dimensions accounted for a significant amount of variance in recall.

Results from previous researchers (Belsky et al., 1996) led to the confirmed hypothesis that securely attached children recalled positive experiences significantly better than negative experiences. Unexpectedly, insecurely attached children did not demonstrate the opposite pattern which may have been a result of the low sample size, which resulted in only 24 children included in the insecurely attached group and therefore the analysis may have lacked statistical power. Nonetheless, the link between secure attachment and memory for positive events, coupled with the association between attachment and positive quality of mood, builds upon existing support for encouraging secure attachment in children.

4.2 Recall Perspectives.

A number of hypotheses were developed to predict the recall perspective naturally used by children to recall their autobiographical memories. D'Argembeau, and colleagues (2003) suggested participants may be more likely to recall positive memories than negative memories from the field perspective in an effort to focus on the affect of the memory; however no significant associations between valence and recall perspective were found in their study. The

current study was designed to test the same hypotheses with children and again, no significant associations were found between valence and recall perspective; children do not appear to demonstrate a tendency to utilize the field perspective to recall affective details of the positive memories.

Hignett and Cartwright-Hatten (2008) proposed that development of observer perspective occurs between 12 and 18 years-of-age and consequently chose the same age range for their sample based on this speculation. Increases in observer ratings due to age were also expected given developmental tendencies for perspective taking skills to increase as children age (Berk, 2000; Blakemore & Choudhury, 2006; Flavell et al., 1981). However, like Hignett and Cartwright-Hatten (2008), no significant associations were found between age and natural recall perspective in this study which indicates that the ability to utilize the observer perspective develops at a much earlier age. Moreover, once children develop visual perspective taking abilities, they are equally as likely to utilize the observer perspective when they are young, as when they age. Consistent with the final hypothesis, older memories were associated with increased ratings of observer recall for memories with negative valence and low arousal, as was found in Nigro and Neisser's (1983) study. As Nigro and Neisser proposed, this relationship is likely due to older memories having more opportunities for reconstruction.

Researchers investigating the impact of recall perspective on recall of emotional events have demonstrated important qualitative differences in the type of details recalled (McIsaac & Eich, 2002; 2004; Nigro & Neisser, 1983) and the amount of anxiety experienced during recall with adults (McIsaac & Eich, 2004). Children demonstrated significantly different patterns whereby children utilizing the field perspective to recall their negative memories did not report increased anxiety at recall. This finding may represent true differences inherent in children's field recall or it may represent procedural differences between studies. McIssac and Eich (2004), in their work with adults with Post Traumatic Stress Disorder (PTSD) asked participants specifically about their traumatic memories, beginning with the moment they were first aware of threat, where participants in the current study were asked to recall memories they might tell a stranger and children were invited to choose any unhappy emotion, including sadness or anger. The natural human reaction in response to threat is anxiety (Cannon, 1929; Steiner, 2002), and therefore the method used by McIsaac and Eich (2004) encouraged more participant reports of anxiety. Consequently, the increased variability within anxiety reported by adults compared to

the children in the current study, likely lead to increased power to detect a significant influence of recall perspective on anxiety. Further, many children in this study reported that utilizing an assigned recall perspective, different than the recall perspective they naturally used, was anxiety provoking in itself. Therefore, our study may have been gathering ratings of children's stress due to taxing their cognitive resources at recall, and not due to the type of recall perspective used.

4.3 Summary of Key Findings

The current study was designed to examine the relationships between predisposing, precipitating, and perpetuating factors, and the quantity and quality of memory details recalled by children and adolescents. It was developed to assist in our understanding of the complex relationship between emotional elements of valence and arousal and children's recall when known variance due to individual differences is removed. Further, this study was developed to provide information on the variables that influence the recall perspective children naturally use to recall their memories.

When relationships between emotional valence, emotional arousal and children's recall were measured together, and shared variance in recall was removed, emotional valence was the component of emotion that accounted for a significant amount of variance in children's recall of negative events associated with high arousal. Emotional valence and emotional arousal accounted for a significant amount of variance when variance attributable to predisposing individual factors was considered; however comparatively, they were not the strongest predictors of recall. Notably, two predisposing factors, age and temperament were the strongest predictors of the quantity and quality of children's recall for emotional events across positive and negative memories with high and low arousal. The results obtained from this study provide important information regarding relationships between emotional valence and arousal when the components of emotion are separated (Brainerd et al., 2008) and individual differences that impact emotional event retrieval are taken into account.

4.4 Practical and Forensic Applications

It is important to understand the manner in which predisposing, precipitating, and perpetuating factors influence children's recall; in forensic contexts, the quantity and quality of the information obtained from child witnesses during forensic interviews is often crucial to the outcome of a case (Marche & Salmon, 2003). Children are often the only witnesses to a crime, particularly in sexual abuse cases (Bottoms, Goulding, Stevenson, Wiley, & Yozwiak, 2007;

Bruck, Ceci, & Hembrooke, 1998; Goodman, Batterman – Faunce, Shaaf, & Kenney, 2002; Lamb, 1999; Shao & Ceci, 2009). In eyewitness interviews and testimony, children are asked to recall very specific information and often after a long delay, sometimes even years after events occurred (Pipe & Salmon, 2009). Through this study, information was obtained regarding the relative importance of variables that influence children's memory which may assist researchers, clinicians, and interviewers in their understanding of children's ability to recall event details. Some children may need more support than others to provide a comprehensive statement of events and to obtain information necessary for convictions.

Results from this study may provide information that can be considered in forensic contexts; however, parents may also find this information beneficial. Although results from this study were correlational and not causal, where possible, parents may encourage children to have a more positive mood, behavioural flexibility, approach tendencies, and regularity as these traits may enhance children's autobiographical recall. Further, these traits have additional demonstrated benefits including enhanced prosocial behaviour (George, 1991), less psychological distress and greater wellbeing (Martin, Nejad, Colmar, & Liam, 2013), openness to new experiences (Switzer, 2006), and enhanced working memory performance (Könen, Dirk, & Schmiedek, 2014), respectively.

Arguably however temperament, according to some theorists (Strelau, 1987; Zentner & Bates, 2008), is biological and therefore resistant to intervention. In this case, interviewers may utilize perpetuating factors or interview techniques to enhance children's recall for different memory components. Specifically, the Comprehensive Narrative Elaboration Technique can be utilized to encourage further disclosure of sensory and cognitive details and the field recall perspective may assist children in providing more contextual, behavioural, and sensory details.

We found no clear benefit in utilizing the observer perspective with children. Therefore, forensic interviewers may find that encouraging a field perspective with children increases the amount of contextual, behavioural, and sensory information without the predicted increases in distress that are characteristic of adult field recall (McIsaac & Eich 2002; 2004; Nigro & Neisser, 1983; Robinson & Swanson, 1993). The advantages of using the field perspective that were demonstrated in this study also provide additional support to existing evidence of memory decay or forgetting (Hignette &Cartwright-Hatton, 2008; Loftus, Garry, & Feldman, 1994; Turtle, Lindsey, & Wells, 2003; Williams, 1994), for restricting time between events and interviews.

Field recall is easier for children to use when events are more recent and utilizing the field perspective enhances recall of contextual, behavioural, and sensory details .

The field recall advantages discussed also have potential implications for current forensic practice. Police investigators have routinely administered to eyewitnesses the Cognitive Interview (Geiselman, 1999), an extensive interview protocol that utilizes different recall instructions in stages to elicit detailed information, which includes instructions for participants to adopt an observer vantage point. However, the *change perspective technique* demonstrated the least utility (Boon & Noon, 1994) compared to other mnemonics (Boon & Noon, 1994; Milne & Bull, 2002). As such, the change perspective technique is rarely used (Boon & Noon, 1994; Kebbell, Milne, & Wagstaff, 1999). Results from the current study support eliminating this technique with children, particularly in forensic contexts.

In addition to investigating relationships between recall perspectives and the types of memory details recall, this study was designed to examine relationships between predisposing factors and the recall perspective that children naturally use to recall their emotional memories. In the current study, recall perspective was not related to age (D'Argembeau et al., 2003), gender (Huebner & Fredrickson, 1999), emotion (McIssac & Eich, 2002; 2004; Nigro & Neisser, 1983), or anxiety (McIssac & Eich, 2004), suggesting that children's motivation for utilizing a particular perspective differs from adult motivation for recall perspective and from study predictions. Prior to this study it was believed (Hignette & Cartwright-Hatton, 2008) that younger children were not capable of using the observer perspective.

4.5 Limitations and Suggestions for Future Research

There were a number of limitations in the current study that are important to note. Firstly, increases in the number of inferential comparisons, such as the multitude examined in this study, contribute to a greater probability of finding an experimental effect, particularly when an alpha of .05 is used to determine significance in data analyses (Field, 2013, Leon, Heo, Teres, & Morikawa, 2007). Moreover, increases in familywise comparisons without adjusting alpha increased the likelihood of a type I error (Field, 2013). A more conservative *p* level was not chosen; however, as several researchers to date (Field, 2013, Leon, Heo, Teres, & Morikawa, 2007) have described the Bonferonni and other alpha adjustments as unnecessarily conservative. These adjustments raise the rate of false negatives or type I errors, often resulting in a failure to identify a high percentage of actual statistical differences (Field, 2013, Leon et al., 2007).

Furthermore, while corrections for multiple tests do not guarantee that a type I error has not occurred, increasingly conservative thresholds are certain to cause researchers to reject real effects across studies. As a result, many behavioural science studies continue to use $p < .05$ as alpha, uncorrected for multiple tests (see Lieberman & Cunningham, 2009, for review).

Secondly, our goal of measuring naturally occurring individual differences in children concurrently comes at the cost of decreased experimental control and reduced causal inference. Thirdly, while forensic implications are implied, given that negative experiences with high arousal may be analogous to situations where children may be called upon to provide eyewitness statements, specific aspects inherent in criminal investigations were intentionally left out of the memories recalled by children in this study (i.e., threat of harm by another individual). In addition, many of these memories did not occur repeatedly over time (as would be the case for abuse; Merrit et al., 1994).

Fourthly, much of forensically motivated research includes measures of suggestibility and accuracy (Fivush et al., 2003) which this study did not include. However, interest in examining children's memory is not limited to resistance to suggestion and accuracy. Moreover, including parent interviews in an effort to assess accuracy of recall may unnecessarily increase demands of parent participation and may have reduced the sample size and the power to detect an experimental effect in the research questions of interest. Future studies may be designed to evaluate whether the CNET, like the NET, is successful in assisting with recalling accurate details of an event without increasing the number of inaccurate details recalled (Bowen & Howie, 2002; Brown & Pipe, 2003a; Brown & Pipe, 2003b; Camparo et al., 2001; Dorado & Saywitz, 2001; Roebers & Beuscher, 2004; Saywitz & Snyder, 1996), particularly for sensory details. Additionally, researchers may be interested in designing a study to evaluate whether field and observer recall perspectives are equally accurate with children, as they are with adults (McIsaac & Eich, 2002)

Fifthly, and again in an effort to restrict parental participation demand and to increase participation, this study utilized a number of self-report measures to test hypotheses drawn from studies using diverse measures, including observer or parental report measures of the domains examined in this study (Goodman et al., 1991; Quas & Lench, 2007). As a result, while utilizing self-report measures to examine constructs measured through other means may provide a broader sampling of the domain (Kerns, 2008), caution must be used in drawing comparisons across

studies. Additionally, while self-report measures were chosen to reflect children's subjective reports of arousal and anxiety, it is possible that instructions for rating arousal and anxiety were unclear and children did not understand the constructs as expected relationships between increased arousal and enhanced recall, as well as increases in anxiety and increased field perspective ratings, were not observed. Future studies may include opportunities to assert children's understanding of these constructs, and opportunities for further elaboration.

Finally, future researchers may examine factors that influence natural recall perspectives in childhood in a larger context now that we have evidence that younger children naturally use the observer perspective for recall. At eight years-of-age, young children are capable of using the observer recall perspective however, the extent to which they remained in the observer or field perspective throughout recall was not measured, nor were they asked about the amount of effort it took to maintain the perspective. Ratings of recall perspective exclusively reflected the strength or the degree of field or observer recall in this study. Researchers may also benefit from examining the influence of recall perspectives on anxiety in experimental conditions in the laboratory or medical environments where options are available for experimental control and assessment of accuracy.

4.6 Conclusion

This study contributed valuable information to the current literature on factors influencing children's memory for emotional events. Previous research implicated emotional arousal and emotional valence as important predictors of children's recall of events; however, the importance of these variables was unclear due to inconsistent findings which may be a result of failure to separate valence and arousal when measuring emotion (Brainerd et al., 2008) or failure to account for individual differences that have been shown to impact emotional retrieval including: age (Saywitz & Snyder, 2006), gender (Salmon et al., 1995), attachment (Alexander, Quas et al., 2002;) and temperament (Gordon et al., 1993). This study aimed to address both of these confounds in an effort to determine the influence of emotion (valence and arousal) on children's recall with the variance due to age, gender, attachment and temperament removed and we discovered that while emotional valence and arousal account for a significant amount of variance in recall of negative, highly arousing events, negative valence was the only emotional component that accounted for a significant amount of variance in children's event recall. Further, this study demonstrated that age and the temperament dimensions of Approach/Withdrawal,

Flexibility/Rigidity, Mood, and Rhythmicity-Daily Habits were the strongest predictors of the number of details children recalled, and various components of autobiographical recall.

Studies investigating the impact of recall perspective on recall of emotional events have demonstrated important qualitative differences in the type of details recalled and the amount of anxiety experienced during recall (McIsaac & Eich, 2002; 2004; Nigro & Neisser, 1983). Similar findings with children were not found. In fact, this study demonstrated that children recall more contextual, behavioural, and sensory details when utilizing the field perspective and differences in anxiety across recall perspectives were not found. Field recall may therefore assist in recall of particular details necessary for correct convictions without increasing the amount of anxiety experienced by children during recall; however, further research on recall perspectives with children is needed.

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Appendix A: Invitation to Participate

Research Supervisor
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Department of Psychology
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Phone 306-966-8076
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Memory Research Lab

UNIVERSITY OF SASKATCHEWAN

Student Researcher
Terri Cordwell, BA
Department of Psychology
University of Saskatchewan
SK Phone 306-261-9441
AB Phone 780-417-2888
Terri.Cordwell@usask.ca

Dear Parent/Guardian,

Your child is invited to participate in a study aimed at helping children remember positive and negative events. This study has two main goals. The first goal is to look at how different factors may affect children's memory of events before, during, and following an event (e.g., age, attachment). A second goal of this study is to see whether different types of interviews influence the kind of memory details that children remember (e.g., details about people, thoughts, and emotions).

Your child will be asked to meet with the student researcher for approximately one hour. **If you agree to allow your child to participate in this study**, please complete the parental consent form and demographics questionnaire attached to this letter and return it with your child to the [insert location of recruitment]. When I receive your consent form, I will schedule a meeting with your child. Your child will also be asked if s/he would like to participate before we begin. **As a gift of thanks for his/her help, your child will be invited to choose an age appropriate prize after the research session and his/her name will be entered into a draw to win one of two $100 Walmart Gift Cards.**

Should you have any questions or concerns, please do not hesitate to contact me or my research supervisor using the contact information above.

Thank you for your consideration.

We look forward to hearing from you!

Sincerely,

Terri Cordwell, BA
Department of Psychology
University of Saskatchewan

Tammy Marche, PhD
Department of Psychology
University of Saskatchewan

Appendix B: Parental Consent Form

Research Supervisor
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Memory Research Lab

UNIVERSITY OF SASKATCHEWAN

Student Researcher
Terri Cordwell, BA
Department of Psychology
University of Saskatchewan
SK Phone 306-261-9441
AB Phone 780-417-2888
Terri.Cordwell@usask.ca

Dear Parent/Guardian,

Your child is invited to participate in a project called **"**Enhancing Children's Autobiographical Recall." Please read this form carefully and feel free to ask any questions you may have.

Purpose: There are two main goals of this study. The first goal of this study is to look at how different factors affect children's memory of events before, during, and following an event. Another goal of this study is to see whether different types of interviews influence the kind of memory details that children remember (e.g., details about people, places, and things). Results from this study may help researchers and police officers create more effective ways to interview children. Children are often the only witnesses to crimes and obtaining information can be hard for police officers and stressful for children. Good interview techniques may help solve crime while lowering the stress that children feel when recalling negative events. This study will examine an interview technique that was less stressful for adults to see if this technique is also helpful for children.

This interview technique helps children change the way they recall an event. People recall events using two different views, a first person (from their own eyes) and a third person view (where they can see themselves like others see them). The type of view people use affects what type of details they remember. When adults used the first person view, they remembered more details about things they felt physically (body sensations) and their feelings. When they used the third person view they remembered more details about how they looked and where objects were in a room. No one has looked at the kinds of details that children remember when they use these different views.

Procedure: Children (ages 8-17) will be asked to meet with the researcher for about one hour. Children will be asked to remember two negative events (e.g., dental appointment) and two positive events (e.g., a birthday party). Children will describe one of each of the events that occurred when they were more aroused (i.e., excited) and the other while they were calmer. First, children will be taught how to use the different views to remember. Next, children will tell the researcher about each event, using the view that they normally use to remember the event. Then, the children will answer questions on two short questionnaires. One questionnaire will have questions about attachment and the other will have questions about temperament.

After the questionnaires are done, children will use one of two views that the researcher chooses for them to remember their events. Children will also describe each memory using one of two interview techniques. Both techniques involve using pictures to help the children provide more information that they may not have reported; however, one interview has more pictures than the other. Children's interviews will be audio recorded. At the end of the meeting, children will choose a small prize and they will be entered into a draw for one of two $100 Walmart gift cards. If you have any questions or concerns about any of these activities, please feel free to contact us before signing this form.

Potential Risks: There are no risks in participating in this project that are beyond those experienced in everyday life.

Potential Benefits: It is important to learn about whether the first and third person view will affect the types of details children remember about an event. This information may be used by memory researchers, police interviewers, counsellors and other professionals who deal with children's memory. This information may help police officers solve crimes and find the people who committed them. And, if remembering events using the third person view causes children to remember less physical sensations and feelings, recalling negative events may be less stressful for children. Using the third person view may mean that the police can spend less time in interviews and interviews may be more comfortable for children. As well, it may be best for counsellors to help people use the first person view to remember positive memories. Remembering positive events has been shown to make people feel better or more positive. We also hope that children enjoy their experience with the researcher and the opportunity to help with scientific discovery.

Storage of Data: Dr. Tammy Marche will securely store all materials and forms used for this project at the University of Saskatchewan. Study materials and consent forms will be stored separately. All data and materials will be kept for a minimum of five years following publication.

Confidentiality: The information that your child provides will remain completely private and confidential. However, if your child states that he/she or another individual has been harmed or is at risk of harm, the researcher may need to report this information to others. Your child's name will not be given to anyone, and it will not appear on any of the study materials. However, when children leave the room, where there are groups of people, others may know that your child is participating in this project. Audio recordings from the interview portion of the study will be erased immediately after the interviews are typed out. A random numbering system will be used to label all collected data. We plan to present or publish results from this study in the future. However, only group findings, not individual scores, will be reported.

Right to Withdraw: Your child's participation is voluntary. He/she is able to quit the study for any reason, at any time, without any penalty and any data that he/she has given will be destroyed immediately. The researcher may also decide to ask a child to leave the study at any time if he/she seems uncomfortable during the study, or if we could not use his/her data. You and your child are able to quit until the data have been entered and analyzed. After data entry, it is possible that some results have already been shared and we may not be able to withdraw the data.

Questions: If you have any questions or if you would like more information about the project, please feel free to ask at any time. You are also free to contact the student researcher or research supervisor at the numbers provided above if you have questions at a later time. This research project has been approved on ethical grounds by the University of Saskatchewan Research Ethics Board on June 19, 2014 (Beh-14-155). You may contact the Research Ethics Office (306-966-2975) if you have any questions about your child's rights as a participant. Out of town participants can call toll free 1(888) 966-2975. To request information about the project results, please put your email address or mailing address below your signature on this form.

Consent to Participate: I have read and understood the information provided above; I have been given an opportunity to ask questions and my questions have been answered satisfactorily.

I consent to allow my child (*please print <u>child's full name</u> and <u>birthday</u>*),

_____ _____/_____/_____

(Child's Full Name) (Month / Day / Year)

to participate in the project described above. I understand that I may withdraw this consent at any time. A copy of this consent form has been given to me for my records.

Please provide your telephone number or email address to allow the researcher to contact you if your child wins one of the two $100 Walmart gift certificates. Please provide your email address or mailing address if you would like to information regarding the study results.

_____ _____

(Signature of Parent/Guardian) (Date)

_____ _____

(Signature of Research Assistant) (Telephone or email)

(Researcher Detach from Form if Completed)

Mailing or Email Address

(Please provide your mailing address or e-mail address if you would like to receive a letter detailing the results of the study.)

_____

_____

Try This Memory Test!

1) Time yourself- you have 10 seconds to take a picture of the teddy bear picture in your mind.

2) Look at the picture on the next page to see what is different. WITHOUT PEEKING circle all the things that have been changed.

3) If you have not found 5 differences, you can compare the 2 pictures together.

4) Check your answers at the bottom of the back page.

ANSWERS

1)Right eyebrow

2)Dots in middle flower

3)Right Eye

4)Left Eye

5)Side stitch

Are You Between 8 – 17 Years Old?

Would You Like to Help Me With My Memory Project?

YOU GET TO PICK A PRIZE AND YOU COULD WIN ONE OF TWO $100 GIFT CARDS

Did You Know…

- There are two different views that adults use to remember events.
- One view causes adults to remember more details about where objects are in the room (like pictures on the wall).
- The other view causes adults to remember more thoughts and feelings.

Only adults have done a project like this! You could be among the first children and youth to try this project!

Would you like to try this project with me?

I will ask you to meet with me for about one hour.

I will tell you how to use these views and then we will practice using these views to remember happy and not happy memories.

I will also ask you some questions. This will help us see if children and youth are like adults when using these views.

If you would like to help, please ask your parents to contact me (Terri):

Phone: 306-261-9441,
Email terri.cordwell@usask.ca

Memory Test Part 2

What is different about this bear?

ARE YOU BETWEEN THE AGES OF 8 AND 17?

WOULD YOU LIKE TO HELP ME WITH MY MEMORY PROJECT?

DID YOU KNOW?

- There are two different views that adults use to remember events
- One view causes adults to remember more details about where objects are in the room (like pictures on the wall)
- The other view causes adults to remember more thoughts and feelings

I WANT TO SEE IF CHILDREN AND YOUTH USE DIFFERENT VIEWS TO REMEMBER EVENTS. YOU COULD BE ONE OF THE FIRST TO TRY THIS!

WANT TO HELP?

I will ask you to meet with me for about one hour. I will show you how to use these views and then we will practice using these views to remember happy and unhappy memories. I will also ask you some questions. This will help us see if children and youth are like adults when using these views.

If you would like to help, please ask your parents to fill out the forms in this envelope and bring them back to [INSERT LOCATION OF RECRUITMENT], and give them to [INSERT DESIGNATED INDIVIDUAL'S TITLE]

Every one who helps will be entered to win a $100 Walmart gift card and everyone gets a prize to take home!

16 OR 17 YEARS OLD?

Please tell your parents about the study but you don't need their permission. You can fill out the forms and bring them in yourself if you would like to help.

Appendix D: Demographics Questionnaire

Instructions: Please read and answer the questions below. In order to keep the information confidential, please do not write your child's name or your name on this questionnaire. These questions help us describe the children that are participating in the study. Please feel free to contact us if you have any questions

1. What is your child's birthday? _____

Month / Day / Year

2. What is your child's gender (circle one): Male / Female

4. What is your child's first language? _____

5. What is your child's ethnic origin (check one):

- ☐ Caucasian/White
- ☐ Aboriginal/Metis/Inuit
- ☐ African American/Black
- ☐ Hispanic/Latino
- ☐ Asian/Pacific Islander
- ☐ Other; please specify:_____

Appendix E: Attachment Security Scale

Kerns, Klepac, & Cole, 1996

What I Am Like With My Mother

Instructions to Child:

This questionnaire asks about what you are like with your mother – like how you act and feel around her. Before we get to those questions, let's try a practice question. Each question talks about two kinds of kids, and we want to know which kids are most like you. Decide first whether you are more like the kids on the left side or more like the kids on the right side, then decide whether that is sort of true for you, or really true for you, and circle that phrase. For each question you will only give me one answer.

Practice Question:

	Some kids would rather play sports in their spare time.		**BUT**	Other kids would rather watch T.V.	
	Really true for me	Sort of true for me		Sort of true for me	Really true for me
1.	Some kids find it easy to trust their mom		**BUT**	Other kids are not sure if they can trust their mom.	
	Really true for me	Sort of true for me		Sort of true for me	Really true for me
2.	Some kids feel like their mom butts in a lot when they are trying to do things		**BUT**	Other kids are feel like their mom lets them do things on their own	
	Really true for me	Sort of true for me		Sort of true for me	Really true for me

3. Some kids find it easy to count on their mom for help

BUT

Other kids think it's hard to count on their mom

Really true for me	Sort of true for me		Sort of true for me	Really true for me

4. Some kids think their mom spends enough time with them

BUT

Other kids think their mom does not spend enough time with them.

Really true for me	Sort of true for me		Sort of true for me	Really true for me

5. Some kids do not really like telling their mom what they are thinking or feeling

BUT

Other kids do like telling their mom what they are thinking or feeling.

Really true for me	Sort of true for me		Sort of true for me	Really true for me

6. Some kids do not really need their mom for much

BUT

Other kids need their mom for a lot of things.

Really true for me	Sort of true for me		Sort of true for me	Really true for me

7. Some kids wish they were closer to their mom

BUT

Other kids are happy with how close they are to their mom .

	Really true for me	Sort of true for me		Sort of true for me	Really true for me
8.	Some kids worry that their mom does not really love them		**BUT**		Other kids are <u>really</u> sure that their mom loves them.
	Really true for me	Sort of true for me		Sort of true for me	Really true for me
9.	Some kids feel like their mom really understands them		**BUT**		Other kids feel like their mom does not really understand them.
	Really true for me	Sort of true for me		Sort of true for me	Really true for me
10.	Some kids are really sure their mom would not leave them		**BUT**		Other kids sometimes wonder if their mom might leave them
	Really true for me	Sort of true for me		Sort of true for me	Really true for me
11.	Some kids worry that their mom might not be there when they need her		**BUT**		Other kids are sure their mom will be there when they need her.
	Really true for me	Sort of true for me		Sort of true for me	Really true for me

12. Some kids think their mom does not listen to them

BUT

Other kids do think their mom listens to them.

Really true for me	Sort of true for me		Sort of true for me	Really true for me

13. Some kids go to their mom when they are upset

BUT

Other kids do not go to their mom when they are upset

Really true for me	Sort of true for me		Sort of true for me	Really true for me

14. Some kids wish their mom would help them more with their problems

BUT

Other kids think their mom helps them enough.

Really true for me	Sort of true for me		Sort of true for me	Really true for me

15. Some kids feel better when their mom is around

BUT

Other kids do not feel better when their mom is around.

Really true for me	Sort of true for me		Sort of true for me	Really true for me

Appendix F: Revised Dimensions of Temperament Survey – Child (Self)

Windle & Lerner, 1986

Participant ID: _____ Today's Date _____

HOW TO ANSWER: On the following pages are some sentences. They are about how children like you may behave. Some of the sentences may be true of how you behave and others may not be true for you. For each sentence we would like you to say if the sentence is usually true for you, is more true than false for you, is more false than true for you, or is usually false for you. There are no "right" or "wrong" answers because all children behave in different ways. All you have to do is answer what is true for you.

Here is an example of how to fill out this questionnaire. Suppose a sentence said:

"I eat the same things for breakfast every day."

If the sentence were usually false for you, you would respond: "A," usually FALSE.

If the sentence were more false than true for you, you would respond: "B," more FALSE than true.

If the sentence were more true than false for you, you would respond: "C," more TRUE than false.

If the sentence were usually true for you, you would respond: "D," usually TRUE.

On the line to the left of each sentence write an A if the sentence is usually false for you, write a B if the sentence is more false than true for you, write a C if the sentence is more true than false for you, or write a D if the sentence is usually true for you

PLEASE REMEMBER THESE FOUR THINGS AS YOU ANSWER:

1. Give only answers that really tell about you. It is best to say what you really think.

2. Don't spend too much time thinking over each question. Give the first answer as it comes to you. Some sentences may seem just like others because they are about the same things. But, each sentence asks about a different part of the way you act. Therefore, your answers may be different.

3. Answer every question one way or the other. Don't skip any.

4. Remember, A = usually FALSE

   B = more FALSE than true

   C = more TRUE than false

   D = usually TRUE

THANK YOU FOR YOUR HELP

---

1. ___ It takes me a long time to get used to a new thing in the home.
2. ___ I can't stay still for long.
3. ___ I laugh and smile at a lot of things.
4. ___ I wake up at different times.
5. ___ Once I am involved in a task, nothing can distract me from it.
6. ___ I persist at a task until it's finished.
7. ___ I move around a lot.
8. ___ I can make myself at home anywhere.
9. ___ I can always be distracted by something else, no matter what I may be doing.
10. ___I stay with an activity for a long time.
11. ___If I have to stay in one place for a long time, I get very restless.
12. ___I usually move toward new objects shown to me.
13. ___It takes me a long time to adjust to new schedules.
14. ___I do not laugh or smile at many things.
15. ___If I am doing one thing, something else occurring won't get me to stop.
16. ___I eat about the same amount for dinner whether I am home, visiting someone, or traveling.
17. ___My first reaction is to reject something new or unfamiliar to me.
18. ___Changes in plans make me restless.
19. ___I often stay still for long periods of time.
20. ___Things going on around me can <u>not</u> take me away from what I am doing.
21. ___I take a nap, rest, or break at the same time every day.
22. ___Once I take something up, I stay with it.
23. ___Even when I am supposed to be still, I get very fidgety after a few minutes.
24. ___I am hard to distract.
25. ___I usually get the same amount of sleep each night.
26. ___On meeting a new person I tend to move toward him or her.
27. ___I get hungry about the same time each day.
28. ___I smile often.

29. ___I never seem to stop moving.

30. ___ It takes me no time at all to get used to new people

31. ___ I usually eat the same amount each day.

32. ___ I move a great deal in my sleep.

33. ___ I seem to get sleepy just about the same time every night.

34. ___ I do not find that I laugh often.

35. ___ I move toward new situations.

36. ___ When I am away from home, I still wake up at the same time each morning.

37. ___ I eat about the same amount at breakfast from day to day.

38. ___ I move a lot in bed.

39. ___ I feel full of pep and energy at the same time each day.

40. ___ I have bowel movements at about the same time each day.

41. ___ No matter when I go to sleep, I wake up at the same time the next morning.

42. ___ In the morning, I am still in the same place as I was when I fell asleep.

43. ___ I eat about the same amount at supper from day to day.

44. ___ When things are out of place, it takes me a long time to get used to it.

45. ___ I wake up at the same time on weekends and holidays as on other days of the week.

46. ___ I don't move around much at all in my sleep.

47. ___ My appetite seems to stay the same day after day.

48. ___ My mood is generally cheerful.

49. ___ I resist changes in routine.

50. ___ I laugh several times a day.

51. ___ My first response to anything new is to move my head toward it.

52. ___ Generally, I am happy.

53. ___ The number of times I have a bowel movement on any day varies from day to day.

54. ___ I never seem to be in the same place for long.

Appendix G: Numerical Rating Scales

Valence

0 Most Unhappy Possible	1	2	3	4	5	6	7	8	9	10 Most Happy Possible

0 Not Happy at all	1	2	3	4	5	6	7	8	9	10 Most Happy Possible

0 Not _____ at all	1	2	3	4	5	6	7	8	9	10 Most _____ Possible

Arousal

0 No Energy at all	1	2	3	4	5	6	7	8	9	10 Most Energy Possible

Anxiety

0 Not Stressed at all	1	2	3	4	5	6	7	8	9	10 Most Stressed Possible

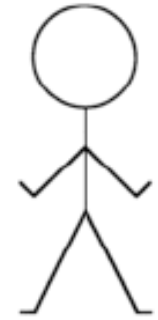
Perspective

0 Not 1st person at all	1	2	3	4	5	6	7	8	9	10 Most 1st person Possible

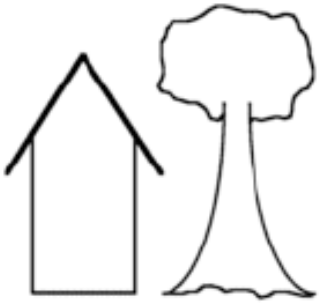
0 Not 3rd person at all	1	2	3	4	5	6	7	8	9	10 Most 3rd person Possible

Appendix H: Narrative Elaboration Technique Reminder Cards

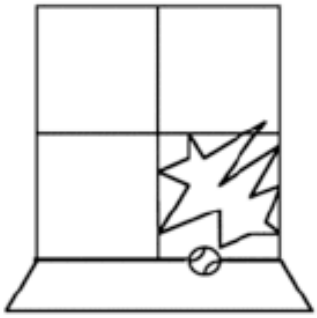
Saywitz & Snyder, 1996



Participants



Setting



Actions

Conversation/Affective State

Appendix I: NET Training protocol

(Adapted from Saywitz & Snyder, 1996; Marche, Briere, & von Baeyer, 2011)

1) Shuffle the NET cards & write down the order in which they are laid down, Introduce the cards in the order in which they are laid down

"In a little while I'm going to ask you to tell me about the four different memories you told me about last time. I will also ask you to remember as much as you can about a story that I will read to you. To help you do this, I'm going to show you a special way to help you remember lots using these different cards." (Show the participant the 4 NET cards.) I want you to know that you shouldn't worry if you can't remember everything that happened; this isn't a competition. Just be honest, try your best to remember as much as you can and please, don't make anything up. Do you have any questions before we start?"

____ "**This is the SETTING card** (point to the 'Setting' card). It shows a picture of a house with a tree to show the different places where things may have happened. When you talk about things that have happened, you should try to remember *the place where they happened,* and *what the place looked like.* You can use this sign to help you remember more about the place where the event happened."

____ "**This is the PEOPLE card** (point to the 'Participants' card). It is a picture of a person that does not look like a boy or a girl. When you talk about things that have happened, use this card to help you remember things about people that were there. For example, *how many people were there, who they were, and what they looked like* would all fit under the Participants card. You can use this sign to help you remember more about the people that were there."

____ "**This is the ACTIONS card** (point to the 'Actions' card). It shows a picture of a baseball breaking a window. When you talk about things that have happened, you should try to remember *what they were doing when it happened, or what they did while it was happening, what other people were doing when it happened or what they did after it happened, and how it happened.* You can use this sign to help you remember what you and others did."

____ "**This is the SAYINGS AND FEELINGS card** (point to the 'conversation' card). It is a picture of a person with a talk bubble coming out of the mouth. When you talk about things that have happened this card will help you remember *the things that they said and felt, and the things that other people said.* You can use this sign to help you remember things that you and others said and felt. Now to help you practice using the cards, we will do a practice story, listen carefully so that you can tell me as much as you can after I read it to you.

Billy and two of his friends, Tommy and Melissa, were riding their bikes to school early in the morning. Tommy was wearing a blue shirt and Melissa was wearing a red hat. Two blocks from reaching school, Billy suddenly yelled "Oops!" and fell off of his bike and scraped his knee. "OUCH! That burns!" He fell off of his bike because he ran over a hole in the road. Billy was upset because he tore his pants and his knee was very sore. He was also worried that he would be late for school. Billy told Tommy and Melissa to go to school while he went home and changed his pants. He thought he would be in trouble if he was late for school and didn't have a good reason so he asked Melissa to explain what happened to their teacher. Melissa asked "Billy, are you sure you're alright?" and Billy told her "Yes, I'm OK. It only hurts a little bit." Billy thought to himself, "I have to hurry!" so he hopped back on his bike and sped back home. When he got there he changed his pants and rode back to school again."
Ask the questions below in the same order as the cards were introduced:

___What part of the story would go under the SETTINGS card (point to the card)? *Descriptions that provide information about the location(s) of the remembered event. For example: Billy fell off of his bike two blocks from school, Billy was on the road.*

___What part of the story would go under the PEOPLE card (point to the card)? *Descriptions that provide information on the people who were there, what they were wearing, etc. For example: Billy, two friends, Tommy and Melissa, Tommy was wearing a blue shirt.*

___What part of the story would go under the ACTIONS card (point to the card)? *Descriptions that provide information about movements or behaviours involved in the remembered event. For example: they were riding their bikes to school, Billy fell off of his bike, Billy tore his pants, Billy drove over a hole in the road, Billy hopped back up on his bike, Billy drove back home, Billy changed his pants, Billy drove back to school.*

___What part of the story would go under the SAYINGS AND FEELINGS card (point to the card)? *Descriptions that provide information about the things people said during the remembered event. For example: Billy yelled "Oops!", Billy asked Melissa to tell the teacher what happened, Billy told Tommy and Melissa to go to school, Melissa asked if Billy was alright, Billy told Melissa he was ok and that it only hurt a little bit. –And-- Descriptions that provide information about how people were feeling during the remembered event. For example: Billy felt upset, Billy was worried.*

Autobiographical Memory Retrieval

Now that you know how to use the cards, I would like you to tell me about your memories. When you're telling me about your memory, try to picture it in your mind and talk about everything that you can remember without making anything up. When you've told me everything that you can remember about what happened, we will use these different cards to help remind you about things that happened that you might not have thought of right away. Don't forget- you shouldn't worry if you can't remember everything that happened; this isn't a competition. Just be honest, try your best to remember as much as you can and please, don't make anything up. Do you have any questions before we start?"

Cover the NET Cards

Say *"Tell me everything you can remember about _____"*

CHOOSE INSTRUCTIONS BASED ON ASSIGNED PERSPECTIVE.

For the 1st Person perspective Say:

"For this memory, I would like you to use the 1st person view as much as possible, like this picture (point) *ok. So in this this view, you can't see the top of your head, you remember it just like it happened"*

For the 3rd Person perspective say:

"For this memory, I would like you to use the 3rd person view as much as possible, like this picture (point) *ok. So in this this view, you could watch like you are outside your body, you could see the top of your head"*

After the child indicates that is all that he/she can provide for free recall, ask:

"Is there anything else you can remember?"

Uncover the NET Cards

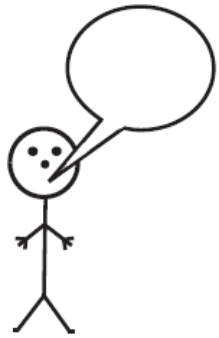
Cue child with each card by asking "*Does this remind you to tell anything else?" "What does it remind you to tell?* **Continue to ask this question for <u>each card</u> until the child says no.**

Appendix J: Comprehensive Narrative Elaboration Technique Cards

Marche, Briere, & von Baeyer, 2011

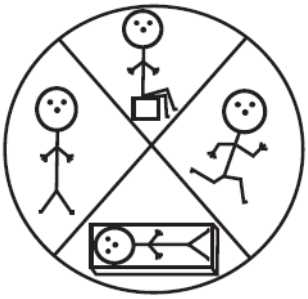
Note: Cards are all the same size when used as stimuli

PLACE



SAYINGS

PEOPLE



ACTIONS

FEELINGS

TIME

SENSES

THOUGHTS

Appendix K: Comprehensive Narrative Elaboration Card Descriptions and Training

Marche, Briere, & von Baeyer, 2011

Shuffle the CNET cards & <u>write down</u> the order in which they are laid down. Introduce the cards in the order in which they are laid down

"In a little while I'm going to ask you to tell me about the four different memories you told me about last time. I will also ask you to remember as much as you can about a story that I will read to you. To help you do this, I'm going to show you a special way to help you remember lots using these different cards." (Show the participant the 8 CNET cards.)

I want you to know that you shouldn't worry if you can't remember everything that happened; this isn't a competition. Just be honest, try your best to remember as much as you can and please, don't make anything up. Do you have any questions before we start?"

____ "**This is the PLACE card** (point to the 'Place' card). It shows a picture of a house with the door open and a tree to show the different places where things may have happened, like inside or outside. When you talk about things that have happened, you should try to remember *the place where they happened,* and *what the place looked like.* You can use this sign to help you remember more about the place where the event happened."

____ "**This is the TIME card** (point to the 'Time' card). It has four pictures on it that are related to time. This one shows the four seasons – summer, fall, winter and spring. This one shows a calendar with the month of the year and the days of the week on it. This one shows a picture of a clock and this one is a picture of a moon and star to show nighttime and a sun to show daytime. When you talk about things that have happened, this card will help you remember *when things happened.*"

____ "**This is the SENSES card** (point to the 'Senses' card). It shows an ear for sounds, a tongue for tastes, an eye for sights, a nose for smells and a body for touch. When you talk about things that have happened, this card will help you remember *the things that you saw, heard, tasted, smelled and felt with your body.* You can use this sign to help you remember sounds, tastes, sights, smells and touch."

____ "**This is the PEOPLE card** (point to the 'People' card). It is a picture of a person that doesn't look like a boy or a girl. When you talk about things that have happened, use this card to help you remember things about the people that were there. For example, *how many people were there, who they were, and what they looked like* would all fit under the People card. You can use this sign to help you remember things about the people that were there."

____ "**This is the ACTIONS card** (point to the 'Actions' card). It shows a person doing different actions like sitting, standing, laying-down, and running. When you talk about things that have happened, you should try to remember *what you were doing when it happened, or what you did while it was happening, what other people were doing when it happened or what they did after it happened, and how it happened.* You can use this sign to help you remember what you and others did."

____ "**This is the FEELINGS card** (point to the 'Feeling' card). This is a card that has a picture of different feelings on it. (read out feelings on wheel and add) "of course there are more feelings than only

these. When you talk about things that have happened, this card will help you remember *how you were feeling on the inside and outside when things happened*."

____ "**This is the THOUGHTS card** (point to the 'Thought' card). It is a picture of a person with a thought bubble coming out of his head. When you talk about things that have happened, you can use this card to help you remember *the things that you were thinking about but didn't say out loud.*"

____ "**This is the SAYINGS card** (point to the 'Sayings' card). It is a picture of a person with a talk bubble coming out of the mouth. When you talk about things that have happened, this card will help you remember *the things that you said, and the things that other people said.* You can use this sign to help you remember things that you and others said."

Now to help you practice using the cards, we will do a practice story, listen carefully so that you can tell me as much as you can after I read it to you.

Billy and two of his friends, Tommy and Melissa, were riding their bikes to school early in the morning. Tommy was wearing a blue shirt and Melissa was wearing a red hat. Two blocks from reaching school, Billy suddenly yelled "Oops!" and fell off of his bike and scraped his knee. "OUCH! That burns!" He fell off of his bike because he ran over a hole in the road. Billy was upset because he tore his pants and his knee was very sore. He was also worried that he would be late for school. Billy told Tommy and Melissa to go to school while he went home and changed his pants. He thought he would be in trouble if he was late for school and didn't have a good reason so he asked Melissa to explain what happened to their teacher. Melissa asked "Billy, are you sure you're alright?" and Billy told her "Yes, I'm OK. It only hurts a little bit." Billy thought to himself, "I have to hurry!" so he hopped back on his bike and sped back home. When he got there he changed his pants and rode back to school again.

Ask the questions below in the same order as the cards were introduced:
___What part of the story would go under the PLACE card (point to the card)? *Answer: Descriptions that provide information about the location(s) of the remembered event. For example: Billy fell off of his bike two blocks from school, Billy was on the road.*

___What part of the story would go under the TIME card (point to the card)?: *Answer: Descriptions that provide information about the time of the remembered event. For example: It was early in the morning, it happened on the way to school, it happened during the school year.*

___What part of the story would go under the SENSES card (point to the card)?: *Answer: Descriptions that provide information about things that were smelled, heard, tasted, physically felt or saw during the remembered event. For example: Billy's knee was very sore, Billy told Melissa that his knee only hurt a little bit.*

___What part of the story would go under the PEOPLE card (point to the card)? *Answer: Descriptions that provide information on the people who were there, what they were wearing, etc. For example: Billy, two friends, Tommy and Melissa, Tommy was wearing a blue shirt.*

___What part of the story would go under the ACTIONS card (point to the card)? *Answer: Descriptions that provide information about movements or behaviours involved in the remembered event. For example: they were riding their bikes to school, Billy fell off of his bike, Billy tore his pants, Billy drove over a hole in the road, Billy hopped back up on his bike, Billy drove back home, Billy changed his pants, Billy drove back to school.*

___What part of the story would go under the FEELINGs card (point to the card)? *Answer: Descriptions that provide information about how people were feeling during the remembered event. For example: Billy felt upset, Billy was worried.*

___What part of the story would go under the THOUGHTS card (point to the card)? *Answer: Descriptions that provide information about the thoughts that occurred during the remembered event. For example: Billy thought he would be in trouble, Billy thought he had to hurry*

___What part of the story would go under the SAYINGS card (point to the card)?: *Answer Descriptions that provide information about the things people said during the remembered event. For example: Billy yelled "Oops!", Billy asked Melissa to tell the teacher what happened, Billy told Tommy and Melissa to go to school, Melissa asked if Billy was alright, Billy told Melissa he was ok and that it only hurt a little bit.*

Autobiographical Memory Retrieval

Now that you know how to use the cards, I would like you to tell me about your memories. When you're telling me about your memory, try to picture it in your mind and talk about everything that you can remember without making anything up. When you've told me everything that you can remember about what happened, we will use these different cards to help remind you about things that happened that you might not have thought of right away

Don't forget- you shouldn't worry if you can't remember everything that happened; this isn't a competition. Just be honest, try your best to remember as much as you can and please, don't make anything up. Do you have any questions before we start?"

Cover the CNET Cards

Tell me everything you can remember about (event description)
Is there anything else you can remember?

Uncover the CNET Cards

Cue child with each card by asking "*Does this remind you to tell anything else?" "What does it remind you to tell?*

Continue to ask this question for each card until the child says no.

Appendix L: Child Assent Form

Research Supervisor
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Memory Research Lab

UNIVERSITY OF SASKATCHEWAN

Student Researcher
Terri Cordwell, BA
University of Saskatchewan
Phone 306-261-9441
Terri.Cordwell@usask.ca

Would you like to help me with my research project? I would like to see if using different ways to talk about your happy and unhappy memories makes you to tell me different information. You do not have to help with the project if you do not want to. To help me with my project, I would like to meet with you for about one hour. I will help you pick four memories to talk about. Then I will show you how to use two different views to remember them. First, you will pick four memories and tell me about your events using whatever view you normally use. Then I will read you some questions and I will write down your answers. Next, you will tell me the same memories again, but this time we will use pictures to see if they help you to tell me more. I will also ask you to tell me your memory from a certain view that I will choose. Anything that you tell me will stay between us. I will not tell your mom or dad or anyone else. The only thing that I would have to tell someone else is if you tell me that you or someone else is in danger or has been hurt by someone else. If you or someone you know is being hurt by someone else, has been hurt by someone else or if someone plans to hurt another person, I have to tell someone. Do you understand?

If you want to do our project, you are allowed to quit at any time you want, and quitting will not make anyone angry or upset. If you want to try this activity, you are allowed to stop at any time you want. You may ask me any questions at any time.

To say "thank you" for your help with this project, you will be able to pick a small prize after we are finished our second meeting. You will also be entered into a draw to win one of two $100 Walmart gift certificates.

Would you like to help me with my project? **Yes / No**

I read and explained this Assent Form to the child before receiving the child's assent, and the child appeared to understand it.

_____	_____	_____
(Name of Participant)	(Researcher's Signature)	(Date)

Appendix M: Data Recording Sheet

(Modified for each condition)

ABC Data Recording Sheet Questionnaires: ASS, DOTS-R, CNET

Child ID:_____ Preferred Time: _____

Event 1: Description_____Pos/Neg

Approximate Date: _____Valence: Pos___ Neg__ Examples Y/N

Arousal:_____ Perspective: F:_____ O:_____

Event 2 Description_____

Pos/Neg Approximate Date: _____ Valence: Pos___ Neg__ Examples Y/N

Arousal:_____ Perspective: F:_____ O:_____

Event 3 Description_____ Pos/Neg

Approximate Date: _____Valence: Pos___ Neg__ Examples Y/N

Arousal:_____ Perspective: F:_____ O:_____

Event 4 Description_____

Pos/Neg Approximate Date: _____ Valence: Pos___ Neg__ __ Examples Y/N

Arousal:_____ Perspective: F:_____ O:_____

Event 1: Description_____**Positive** High Arousal:

Assigned Perspective: 1st Anxiety:_____

Event 2 Description_____**Positive** Low Arousal:

Assigned Perspective: 1st Anxiety:_____

Event 3 Description_____ **Negative High** Arousal:

Assigned Perspective: 3rd Anxiety:_____

Event 4 Description_____**Negative Low** Arousal:

Assigned Perspective: 3rd Anxiety:_____

Appendix N: Field and Observer Picture Examples

IGN, 2014

Appendix O: Counterbalancing Procedure

The four different counterbalancing orders that were used to prevent order effects from influencing the number of details recalled by children and youth. Negatively valenced memories associated with high arousal were not recalled last in any condition to protect against children leaving the study in a distressed state.

Condition	Events Cue Order	First Questionnaire	Second Questionnaire	Interview Technique
ABC	Positive First	ASS	DOTS-R	CNET
ABD	Negative First	ASS	DOTS-R	NET
BAC	Negative First	DOT-R	ASS	CNET
BAD	Positive First	DOT-R	ASS	NET

Condition	Event	Valence	Arousal	Perspective
ABC	1	Positive	High	1
	2	Positive	Low	1
	3	Negative	High	3
	4	Negative	Low	3
ABD	1	Negative	High	1
	2	Positive	High	3
	3	Negative	Low	1
	4	Positive	Low	3
BAC	1	Positive	Low	3
	2	Negative	High	3
	3	Positive	High	1
	4	Negative	Low	1
BAD	1	Negative	High	1
	2	Negative	Low	3
	3	Positive	High	3
	4	Positive	Low	1

Appendix P: Memory Component Coding

Marche, Briere, & von Baeyer (2011)

Sensory/Somatosensory

Involves aspects of the memory that describe specific stimulation of the five senses including sounds, tastes or smells that are remembered as being part of the event as well as specific details regarding the intensity or quality of remembered information (e.g., brightness, loudness, colour, clarity), rather than general contextual information (e.g., 'I saw two girls there').

- Other autonomic reactions, nociception (involves the conscious or unconscious physiological perception of pain carried to the brain and spinal cord that indicated actual or potential tissue damage) and somatosensory information are also included under the sensory component and includes information regarding the state of the body that is not available through the other five senses (e.g., posture, balance, itch, pain).

Affective/Emotional

- Involves the subjective, self-reported feelings and emotional reactions (e.g., tension, fear) that are associated with the recalled event. This can include positive (e.g., happy), negative (e.g., sad) as well as neutral (e.g., not happy or sad) feelings associated with the remembered event but the detail must be emotionally linked and apart from physiological changes (e.g., increased heart rate) as well as cognitive (e.g., I thought I would faint) and behavioural reactions (e.g., crying).

Cognitive

- Describes the individual's unique inner thought processes experienced during the recalled event.
- Encompasses the individual's inner dialogue including the degree of self-control and understanding about the source of actions in the event, as well as the anticipation, expectation, and afterthought involved with the event.

Contextual

- The contextual element of an autobiographical memory describes the environment or setting of the recalled event. The contextual component includes information about the time, place, location, identity and state of individuals, groups and/or objects involved in the memory (i.e., features of the setting in which the event took place).

Procedural

- Encompasses the serial order of the remembered event (i.e., what happened first, second...). Aspects of the procedural component often include contextual features but the information must be related to the sequence of the remembered event to be considered a procedural detail. For example, in the phrase "First the nurse cleaned my arm then she poked it with a needle," the 'nurse' would be classified as part of the context of the memory (who was there) but the fact that the nurse cleaned the child's arm and then inserted the needle is part of the sequence of events and therefore a procedural component of the memory.

Behavioural

- The behavioural component of autobiographical memories refers to the physical movements, reactions and/or responses (including coping and stress responses) from the self or others involved with the recalled